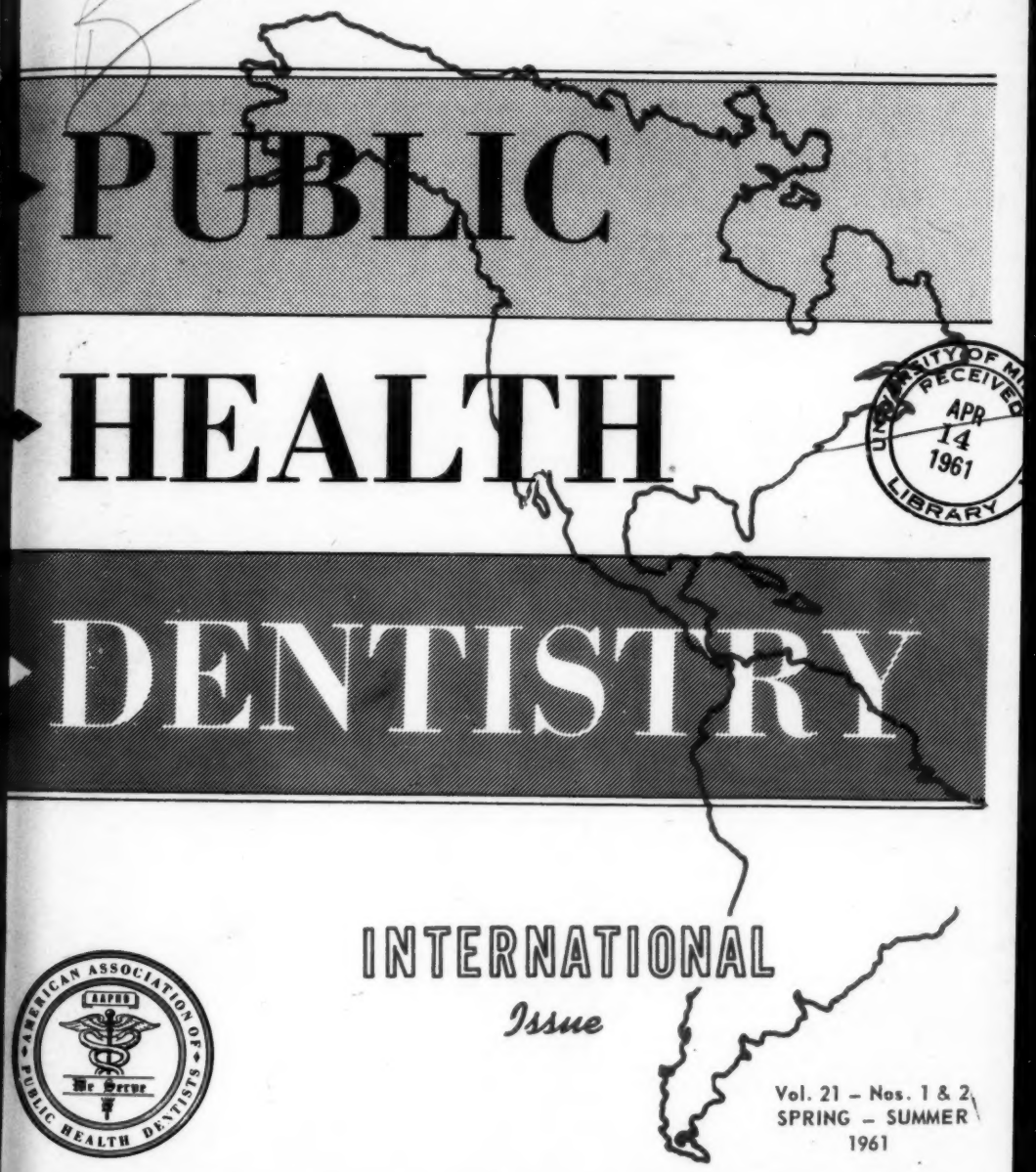
PUBLIC HEALTH DENTISTRY



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SPRING – SUMMER
1961

OFFICIAL BULLETIN OF THE
AMERICAN ASSOCIATION of PUBLIC HEALTH DENTISTS

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A MESSAGE FROM THE PRESIDENT

A large attendance and a rewarding program combined to make the mid-winter meeting in Chicago in February one of the most successful in my experience. We were especially pleased to have as guests a number of institutional dentists, and their presence compensated in part for the absence of some of our snowbound members.

All of us are indebted to those who planned and participated in the program. Dr. Wesley Young's enlightening discussion of the "Report of the Commission on the Survey of Dentistry in the United States" left us with a great pride in the advances being made in dentistry and an equally strong determination to do our part in meeting the challenges presented by the report.

The live demonstration of equipment and techniques which have been developed to provide dental services at the bedside was particularly interesting, and served to emphasize the progressive attitude so characteristic of public health dentistry. At the request of many members, we hope to repeat the demonstration at our Philadelphia meeting. There, too, we plan a publicity campaign to attract dentists in private practice to the demonstration, so that they may gain firsthand knowledge of the techniques for bringing dental care to the homebound and chronically ill.

Within our Association, one of the important goals for the year is the development and promotion of "Public Health Dentistry," our Bulletin. Much progress has been made. The recent changes in the Bulletin have been well received. But much more needs to be done.

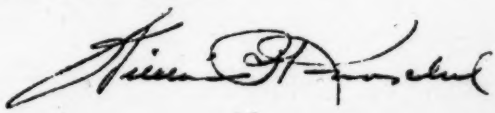
All of us are aware that the Bulletin is not reaching the wide audience it merits. All of us are also aware that there is no health department, whether it be local, state, or federal, which could not benefit from the ideas and approaches to dental public health presented in the Bulletin.

This is particularly true, I believe, of local health officers and local health departments. For nearly every article – and recent coverage has ranged from studies of the effectiveness of topical applications of stannous fluorides to discussions of dental grants in aid – has application and meaning in the development of local dental health programs.

Equally informative and instructive articles are planned for the months ahead. The issue before you is composed entirely of contributions by dental health personnel in other nations. Their reports on dental health activities abroad and their ideas may well be incorporated into some of our own programs.

Also to come is a resume of the workshop on local dental programs to be held at the University of Michigan in June. The Bulletin's report will be a wonderful opportunity for the local dental health officer who cannot attend to preview the local dental health programs of the future; it will also be a permanent record of the workshop for those who can attend.

Widely read, the Bulletin can be an effective instrument in our efforts to advance the field of dental public health. I ask the support of each of you in the drive to bring the Bulletin to a larger audience.



PUBLIC HEALTH DENTISTRY

Official Bulletin of the AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

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Original manuscripts believed suitable for publication in this journal are invited and should be mailed to the Editor.

PREPARATIONS OF SCIENTIFIC MANUSCRIPTS

1. Manuscripts should be typed, double-spaced, on one side of 8½ by 11 inch bond paper allowing two inch margins.

2. The title should appear at the top of the first page, followed by the name and degrees of the author or authors. The address of the author should appear at the end of the article.

3. The name of the group before which the paper was presented, the date and place of delivery and the author's university, hospital or government affiliation, if any, should appear on a separate sheet.

4. Data presented in charts and tables should be discussed but not repeated in the text.

5. A concise summary and a precise conclusion add to the value of a scientific article. The summary should state briefly the purpose of the article and the main facts presented or reviewed.

6. Bibliographic references should be in numerical sequence and correspond to the numbers placed in the text where they are mentioned. Both footnotes and references should appear on a separate sheet.

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1

The Evolution Of Public Health Dentistry

F. Bruce Rice, B.D.S.

Dentists have always been regarded as rugged individualists, and it may be for this reason that a career in public health dentistry has hitherto had little attraction for the average graduate. With the whole emphasis of dental education in the past placed on preparation of the student for private practice, it is easy to understand why dentists entering public health services were regarded by some of their confrères as inferior beings unsuited for the hurly-burly of private practice, or misguided philanthropists who eschewed the rewards of private practice for the mythical ideal of benefiting their fellow men on a wider scale. The financial rewards of a public dental service career were often pitifully inadequate and did not in themselves attract the more progressive members of the profession; the necessary subordination of the individual to a bureaucratic organization held little appeal for the rugged individualist; frequently public dental services were completely under the domination of medical directors with no real interest in dental problems; funds and staff were difficult to obtain and when obtained were usually inadequate.

Over the years and after much effort and many frustrations, all this is changing, due largely to the activity and support of the profession as a whole, plus a gradually growing and insistent demand for dental attention from the lower income groups of the population. Public health dentistry is now a specialized career and has achieved a stature (and the public health dentist a status) which only a generation ago would have seemed impossible. In many countries today the dental division has its own dental director and is virtually autonomous, although established as a recognized administrative unit within the health structure; it has its own budget provision and salaries are on a level with the other divisions of the public health service. In countries where this is not so, the profession must not relax its efforts to bring it about. It is significant that every WHO dental health seminar has stressed this point, contending that real progress in developing the dental services of a country cannot be made until dentists themselves organize and control them.

Accent on Prevention –

Another important change in public health dentistry is the emphasis now placed on prevention. The old concept of curative dental care is fast giving way to preventive services and to preventive measures, to concentration of efforts on the incremental care of the younger age groups of the population and to measures such as the fluoridation of water supplies and the topical application of fluoride solutions. It is possible that better public appreciation and understanding of dentistry stems partly from the good results and publicity which have been obtained by these preventive measures.

–and Care

There is an increasing public awareness of the need for dental health services and a consequent demand for expansion of facilities. For many years it has been the accepted custom to provide some form of free dental care for the indigent, and to leave the remainder of the population to seek treatment at the hands of the private

dental practitioner. Those on modest incomes often suffer under this arrangement and find it difficult or impossible to finance adequate dental care for themselves and their families.

It has often been stated that wars bring no advantages in their train. This is undoubtedly so in most respects, but the past two world wars have served to emphasize the need for national fitness including dental fitness. The provision of free dental care for members of the armed forces in these wars has stimulated appreciation of, and later civilian demand for, dental care programmes. In the writer's own country (New Zealand), the parlous dental state of the nation's recruits in World War I made the politicians more conscious of dental problems and led to the immediate formation of the Dental Corps. It also was mainly responsible for the government's resolve to institute a school dental service immediately the war ceased. Knutson [1], discussing the advances in dental public health in the United States between 1943-1953, reported similarly concerning the United States in World War II when he says,

"Of the first two million men examined for induction into the armed services, more were rejected because of failure to meet dental qualifications than because of any other physical defect. About one out of every 12 men examined were rejected because of dental defects. At that time we knew that the nation's children were receiving less than one-fourth of the dental services they required..."

As an illustration of the change in the general attitude towards dentistry may we quote Field Marshal Lord Montgomery [2]:

"I will always remember Churchill's anger when he heard of several dentist's chairs being landed over the beaches in Normandy! But we have learnt since the 1914-18 war that by caring for a man's teeth, we keep him in the battle."

John E. Fogarty [3] sums up from the politician's angle, as follows:

..."If there is agreement that dental health is an integral part of total health – and I believe there can be no argument on this point – then we must also make dental care an integral part of any programme of medical care. We have not gone very far, as yet, in providing comprehensive dental care for the mass of people."

..."The health of America is our Nation's greatest resource. Some people seem to feel that we cannot afford to improve our health status much further – that the cost is too great. I submit that we cannot afford not to improve it."

..."The broad objective of the dental and medical professions should be to take the leadership in giving the people of this country their maximum health opportunity."

Many other similar remarks could be quoted but sufficient has been said to indicate that there is a growing public awareness of the problems of dental ill-health. With the tide in our favour, therefore, the dental profession must be prepared to take it at the flood and launch realistic programmes for the protection and promotion of dental health. Leaders of the profession are continually warning us that if the profession fails to take the initiative, the politicians, backed by the public will.

DENTAL PUBLIC HEALTH PROBLEMS

We are aware of the main dental problems confronting the profession – dental caries, periodontal disease and handicapping conditions such as gross malocclusion and cleft palate. However the public health dentist is faced with other problems which must first be solved before the dental problems can be managed – the problems of money, personnel and supplies.

We are aware, that, given an adequate supply of these three essentials, we can

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in due time and with good planning provide curative and preventive services to meet the needs of a population.

Money: It is a well known axiom that one cannot obtain something for nothing and this applies to dental services, the cost of which is met by the public in a number of ways:

(1) As individuals, by direct payment to the dentist for his services, with or without pre-payment and post-payment plans.

(2) Collectively in groups, by insurance schemes, staff dental benefits, etc.

(3) Collectively in whole populations, by taxation.

Payment for dental services may be voluntary as in (1) and in some types of schemes in (2), or it may be compulsory as in (3) and in some types of (2). Where payment is compulsory, maximum demand is assured. Where it is voluntary, demand increases only to the extent that the individual can be persuaded that he requires treatment, either regularly or spasmodically. Compulsory payment schemes (and some types of voluntary schemes) interpose a third party in the dentist-patient relationship and may restrict the patient's right to choose his own dentist. For these reasons the average private practitioner dislikes them, whilst the public health dentist, having in view the ideal of complete dental health for all the population, veers toward them.

Dental Personnel: In most countries the supply of dentists is insufficient to meet the demand for treatment and in very few are the needs of the priority group (children) being met at all adequately. An increased output of dental graduates by the establishment of more dental schools may compensate in some degree for population increase but cannot hope to meet effectively the requirements of the priority group if complete coverage is envisaged. This is the position in Europe and America, and it is infinitely worse in Africa and Asia where the ratio of dentists to population is so much more unfavourable and where some countries have as yet no formal courses for the training of dentists. Lack of funds for establishing dental schools in these countries necessitates the recruitment of foreign dentists and the granting of government scholarships for local students to study dentistry overseas. Both of these methods are costly and are unlikely to materially improve the dental manpower position.

In Europe and America, recruitment of students is usually a continual problem, for dentistry as a vocation lacks the popular appeal of some of the other professions. In many African and Asian countries there is a dearth of prospective students with the basic education required for the dental, medical and other professions.

If the benefits of dental treatment are to be extended to a larger segment of the population, the dental profession must follow the lead of the medical profession and delegate more of its work to well-trained auxiliaries such as dental hygienists and school dental nurses, while continuing to utilize to the fullest possible extent the services of dental assistants, receptionists and laboratory technicians.

In a previous paper [4], the writer has discussed the question of auxiliaries and it is not proposed to cover the subject again here except to affirm that their use, carefully graduated quantitatively and in the scope of their duties by the needs of the country, is in his opinion the most hopeful solution of our dental manpower problem.

Dental Supplies: If the first and second essentials – money and manpower – are available, the problem of dental equipment and supplies should be capable of ready solution.

Napoleon is reputed to have said that "an army marches on its stomach." It is equally true that a dental service is only as efficient as its supply system. In countries remote from the sources of supply, forward ordering of dental equipment and materials, air-conditioned storerooms for perishable goods, efficient and rapid handling of stores orders from dental clinics, and an equipment repair and maintenance service are mandatory. Some measure of standardization of stores items is always found necessary, certainly for the more essential items. This problem of supply can be one of the most difficult to solve in the less developed countries, particularly if money, trained personnel, and storage facilities are limited.

State Planning: In all countries the cost of dental treatment is high and many people cannot afford to pay for it. Many others, however, especially in the Western countries, prefer to spend their money on (to them) more important items such as tobacco and alcohol. As an example, nearly two billion dollars were spent on dental care in 1959 in the United States. This is a large sum of money, but in the same year 16.6 billion dollars were spent on tobacco and alcohol[5]. Would it be possible to reverse these figures by advertising on a level with the tobacco and alcohol manufacturers and financed by extra taxation on their products? It is an interesting thought!

Public demand for dental care is reflected in the political field by the tendency of governments to participate more and more in planning, subsidising and actually operating dental care programmes.

In Great Britain, for example, a National Health Service which includes dental treatment has been in operation for a number of years and the training of dental auxiliaries is about to commence. In 1959, the fees authorised for payment to dentists under this scheme amounted to £47,491,302 (approximately 142 million dollars)[6].

In the Scandinavian countries and New Zealand, dental education and children's dental services are largely financed out of public funds. In New Zealand, the government, spurred on by the New Zealand Dental Association and by the revelations of the appalling dental condition of its World War I recruits, commenced a school dental service in 1921. There were not enough dentists for the purpose and a sufficient supply could not be foreseen in the measurable future as recruitment of dental students was then at its lowest ebb. The private dental practitioner (the late Sir Thomas Hunter) who had been given the responsibility of planning a school dental service seized on a novel suggestion which had been made several years previously by another private practitioner, and decided to train auxiliaries (school dental nurses) to perform fillings and extractions for children. The Dental Association officially endorsed the proposal and is proud of the fact that all New Zealand's primary school children and nearly half the pre-school population (from two and a half years) are now receiving efficient and regular dental care. The whole of this service, plus the follow-up dental care of adolescents by private practitioners on a fee-for-service basis, is financed by the government from taxation.

In most of the eastern European countries, the private practice of dentistry has virtually ceased to exist and the dental profession is state controlled and organized. This simplifies planning to meet such problems as population needs in rural areas and the supply of personnel, equipment and materials, as this is part of the wider general plan for economic, social and cultural development.

In other countries the state may impose partial restrictions on private practice. For example, in Indonesia the new graduate is required to spend a period in government service, usually in a rural area, before entering private practice. In Eqypt, again

with a view to assisting the rural areas, some of the main cities have been declared "closed" for new practices. Many and varied are the means which may be taken by the state to ensure an equitable distribution of dental care services.

In Africa and Asia, good planning is available in many places but money is in short supply, therefore the general scheme is to first cover the country by placing dental clinics at the main centres of population, then to extend to the small centres as funds permit. In the initial stages the dental officers will be mainly engaged in providing a relief-of-pain service. As more money and staff become available, conservative and preventive treatment, aimed particularly at the child population, will gradually be introduced. Most of these countries require some form of auxiliary dental personnel – dental technicians, dental hygienists or school dental nurses – and already training schemes are well established in Malaya (dental technicians and school dental nurses), Nigeria (dental technicians and dental hygienists), Ceylon, Thailand and Indonesia (school dental nurses). Generally speaking, these countries are far more ready to adopt unconventional solutions to their dental problems than are the European countries. They have vast dental problems, particularly in the periodontal field. Dental manpower is scarce, typical examples being Nigeria, with a population of 35 million and with 26 dentists, and India, with a population of 400 million and 5000 dentists, four-fifths of whom have had no formal dental training. Planning in these countries is progressing quietly and efficiently but no early solution of their problems is possible. The most that can be hoped for in the meantime is to bring emergency dental treatment within reasonable reach of the mass of the population and to concentrate preventive efforts on the children.

THE ROLE OF THE WORLD HEALTH ORGANIZATION

The World Health Organization believes that "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being," and that "the health of all peoples is fundamental to the attainment of peace and security." [7] The cooperation of States and individuals is essential to achieve these aims. Already in the field of medicine, notable gains have been made in the control of such killing diseases as malaria, smallpox, cholera and plague, with spectacular effects on national economics. In dental health, progress is slower and less spectacular – in line with the nature of dental disease. Further the World Health Organization administrative unit for dental health is only five years old and is consequently small.

As a general principle, WHO works primarily by organization and co-ordination, by finding the knowledge required to deal with a health problem and transferring it to the place where it can act. The simplest way is to find a person with the necessary knowledge and experience and to send him to the country which has requested help. Problems where the answers are not clearly defined may be referred to study groups or expert committees for guidance. WHO does not usually undertake research but helps to bring together the right people to put the results of research to practical use. It does not go into a country except at the request of the government and then only if the government is prepared to carry on the particular project as part of its national health programme. [8]

There are four main ways in which the interest of a government may be captured and requests thereby stimulated, namely, by persons and organizations within a country, by visits of WHO staff, by the convening of

intercountry seminars, and by the reports of study groups and expert committees. Let us consider each of these in turn with particular reference to dental health.

Persons and Organizations within a Country

An active dental profession can do much to interest public health authorities and politicians in dental health by presenting "shocking" facts and arresting figures on dental ill-health and by insisting on remedial measures. Mention has been made already of the beneficial repercussions in New Zealand after the revelations of World War I – *"one-third of the otherwise eligible recruits rejected on account of dental disability"* – and it is statements such as these which impress. Recent examples are:

"Teeth of Iroquois can last in the mud for 400 years with little damage, but modern teeth can only last two or three years in the mouth of a Toronto child."[9] (made apropos an archaeological discovery).

In Great Britain,[10] 527,600 man-days were lost to industry in 1957 owing to dental sickness involving absences of more than three days, and it was estimated that a further 1,000,000 man-days were probably lost through absences of less than three days.

The first objective of the dental profession in a country should be to obtain a place in the framework of the public health department for a dental section headed by a dentist of good standing. Without a "representative at court," as it were, it is difficult for the profession to plead its cause. The next step is to support this public health dentist in planning and implementing a dental programme based on realistic and practical lines. Many programmes have been shelved because they are too ambitious. The programme must be graduated to the socio-political climate and be economically practicable.

A country requiring assistance in programme planning can obtain it from WHO in the form of a consultant of recognized standing from another country. Such a consultant may serve only to emphasize what is already in mind, sometimes he may bring a new approach, but always his report will carry more weight as it is sponsored by an international organization.

Consultants are also recruited to advise on specific problems such as water fluoridation, children's dental services, dental education, training of auxiliary personnel and so on.

If a country lacks specialists in various fields – public health, children's dentistry, dental education, dental research, – the granting of WHO fellowships for postgraduate study will help to overcome the deficiency. Fellowships may also be granted to senior personnel of dental health services and dental schools for tours to study developments in other countries.

The initial principle still exists – the requests must come from a government–but who is better qualified to judge dental health requirements than the dentists themselves, particularly those in the fields where assistance is sought. By representing their case to the government, with the support of the profession and their dental representative in the public health service, something may be achieved. *However, nothing can be done until someone acts within the country.*

Visits by WHO staff

These visits have a dual purpose – to ascertain a country's dental problems or progress and to suggest means for solving them or speeding it up (as the case may be), and to stimulate, encourage and establish a liaison with the local members of the dental profession. Knowledge of the problems of individual countries is essential for

planning at headquarters level, for advising regional offices, and for an intelligent appraisal of requests. Reports on each country are sent to the regional offices concerned for action or guidance and are filed at headquarters where they provide a valuable source of reference for present and future dental officers.

There is no gainsaying the stimulating effect of a visit from a WHO officer. It has been the writer's experience that these visits are not only welcomed but that they often bridge the gap between desire for assistance and the lack of knowledge as to how to go about getting it, and that they very definitely help to place dental health "on the map" with the national health authorities.

Intercountry meetings

Dental health seminars are initiated in the regions but are not necessarily limited to the countries in those regions. Consultants or advisors are provided by the Organization to give authoritative information on specific dental problems, and the whole of the cost of the transportation and accommodation of both consultants and country representatives is met by the Organization. From the viewpoints of finance and organization, a seminar is a major undertaking. Three dental health seminars have so far been held – in Wellington, New Zealand (1954), Adelaide, Australia (1959) and Goteborg, Sweden (1960).

Seminars are usually organized on the principle of active participation and take the form of a series of plenary sessions interwoven with discussion groups.

They provide a valuable forum for the interchange of opinions and for the discussion of problems and the methods used to solve them in the various countries. They serve to bring about a wider knowledge of dental problems and a broader outlook internationally, besides initiating useful professional contacts and friendships. Seminar reports are utilized by participants for instituting reforms and new ideas when they return to their own countries.

Reports of study groups and expert committees

As mentioned previously, these types of meetings are held when the methods of dealing with a problem are not clearly defined. A study group was convened in Brussels in 1958 to consider the question of dental health services for children as affecting the European Region. Three expert committees have been convened in Geneva, the subjects covered being the fluoridation of water supplies (1957)[11], auxiliary dental personnel (1958)[12], and periodontal disease (1960)[13].

The reports of these meetings are forwarded to governments and are available to the public either direct from the Organization or through agents in practically all countries. They are therefore an excellent means of disseminating knowledge and stimulating requests for assistance.

THE FIELDS OF PARTICULAR INTEREST TO W.H.O.

All aspects of health are of interest to WHO but, having in view the broad objective of "the highest attainable standard of health," the preventive and public health aspects are naturally of greater interest than the curative per se. In dental health the accent is on prevention by the utilization of all known preventive measures and by encouraging dental services for children based on dental health education and systematic (incremental) dental care from an early age. WHO assistance in the fields of dental education, training and research aims to up-grade dental education at the univer-

sity level, to promote the training and wider use of auxiliary dental personnel, to provide dental public health specialists and research workers, and to permit senior personnel in all these fields to study developments in other countries. From the inauguration of WHO's programme to the end of 1959, 86 fellowships in dental health have been granted, whilst consultants have been provided for countries on eleven occasions.

There is great scope for further development of our programme if requests are forthcoming but, as pointed out earlier in this paper, the dental profession itself must play a leading part in stimulating such requests. The International Dental Federation has been very active in supporting the dental programme of WHO and in encouraging its member associations to do so. Many of these associations, although composed largely of private practitioners, take a sincere interest in the problems of dental public health as they affect their own countries but have not yet developed the "international outlook." Public health dentists could help in the development of the profession along these lines by ensuring that all pertinent WHO reports and publications have a place in the discussions at dental society meetings.

The World Health Organization requires far more professional support and active publicity of this type if it is to fulfill its great humanitarian objectives.

BIBLIOGRAPHY

1. Knutson, John W. Dental Public Health Accomplishments and Predictions, Amer. Jour. Pub. Health, 44, 3, March 1954.
2. Montgomery of Alamein. "Memoirs." Companion Book Club, London, p. 321.
3. "Dentistry's Expanding Horizons and increasing responsibilities." US representative John E. Fogarty, J.A.D.A. 59, 286-289. August 1959.
4. "Utilization of Auxiliary Dental Personnel" – paper presented to the International Dental Public Health Conference, New York, September 1959.
5. US Department of Commerce. "Survey of Current Business," July 1960.
6. Report of the Ministry of Health, 1959.
7. Constitution of the World Health Organization. (Off. Records of WHO, 2, 100.)
8. Basic facts about the World Health Organization – Second edition 1960.
9. Grainger, R.M. "Dental Health Conditions in Metropolitan Toronto."
10. Report of the Ministry of Health, 1957.
11. WHO Technical Report Series No. 146.
12. WHO Technical Report Series No. 163.
13. WHO Technical Report Series (in press).

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Dental Public Health In CANADA — 1960

F. McCombie
L.D.S., R.C.S., D.P.H.

The dental public health problem in Canada is basically the same as throughout the world — the unnecessary and untreated dental disease and abnormalities of a significantly large segment of the total population.

The nation-wide "Canadian Sickness Survey, 1950-51" carried out by the National Department of Health and Welfare estimated that during that period only 27.6% of all family units of Canada made payments for dental services.[1]

A survey of dental practice (1958), carried out by the Canadian Dental Association reported that Canada's 5,800 dentists served that year approximately 34% of Canada's 17,000,000 population.[2]

In 1960 was held the first Canadian Conference on Children which heard a report by the Council on Public Health of the Canadian Dental Association.[3] Therein it was estimated that eight out of ten Canadian elementary school children (5-15 years) had open cavities needing treatment. It was also reported that in areas of Canada best supplied with dentists, less than one-fifth of the total need for treatment of dental caries alone can be met, while in other areas less than 10% of the total need is being provided.

The Council on Public Health of the Canadian Dental Association fully appreciates the need for more accurate and more comprehensive data regarding the dental health status of the people of Canada.

To this end the Council prepared the Canadian Dental Survey Manual, with the assistance of R.M. Grainger, Faculty of Dentistry, University of Toronto and of others. This methodology was approved by the Board of Governors of the Canadian Dental Association at their 1960 meeting. They also requested that each of the ten provincial dental associations ensure that an initial survey of a random sample of children in their province be carried out before the close of that year. Thereby, it is hoped to establish the first series of preliminary national dental health indices during 1961.

DENTAL PERSONNEL

At the commencement of 1960 the Canadian Dental Association reported the ratio of dentists to population as 1 dentist to every 3,018 persons in Canada.[4] However, there is, as in other countries, a concentration of dentists in the centres of larger population.[5] Slightly more than 54% of the total population of Canada are resident in cities of 10,000 persons or greater. More than 77% of the dental profession have their practices in these cities. In the other communities of Canada the ratio of dentists to population stands at 1: 6,061.

To supply the much needed recruits to the dental profession of Canada there are at this time six dental schools which in 1959 graduated 193 new dentists.[6] However, by the recent establishment of a new school at the University of Manitoba and new and increased accomodation at the University of Toronto, the total capacity of each of the undergraduate classes in Canadian schools is now 307. During the academic year 1959-60 a total of 46 Canadian students attended dental schools in the Unites States, whilst 59 American students were enrolled in the Canadian dental schools. In addition, in the Canadian schools were enrolled 44 undergraduate students of other countries, mostly from the British Commonwealth.

Facilities for the training of dental hygienists are as yet available at only one University in Canada. At the new dental

school of the University of Toronto accommodation has been provided for 50 dental hygiene students in each year of the two-year course. Considerable activity is now under way to improve the registration for this course, and this has improved from 8 students accepted in the fall of 1959 to over 20 in 1960.

The Board of Governors of the Canadian Dental Association, meeting in Ottawa in September, 1960, agreed upon and issued a policy statement of significant and far reaching importance to the future practice of dentistry in Canada and perhaps elsewhere. This statement, entitled "Projection of Dental Services in Canada" stated as its main objective – "To meet the demands of the public for dental services, by providing more good dental service to more people at a cost that is within the public's ability to pay." [7]

The following "Definition of Policy" includes the statement – "Increase the number of dental auxiliaries and expand the services they are legally permitted to render." [8]

In further explanation of this aspect it is also stated – "Properly qualified and recognized dental auxiliaries could be trained to render a broader scope of service than that presently recommended. The training of these new auxiliaries must be at the direction of the dental profession, and should be given at a recognized dental school. The services that these auxiliaries are qualified to render must be included in the prescribed teaching program, and must be under the direct supervision of a qualified dentist. These services must not include those operations requiring the scientific knowledge of the fully qualified dentist (e.g. case assessment, treatment planning, cutting or severing of hard and soft tissues, the administration of drugs, the making of prescriptions) but should include many of the technical operations and technical parts of operations for which purpose auxiliary personnel has been adequately trained. The licensed dentist must retain full responsibility for the patient's welfare."

In this regard two most interesting pilot projects are being developed. In Manitoba the board of the provincial dental association sponsored an amendment to the Dentistry Act of that province (subsequently passed by the Legislative Assembly) whereby the duties of dental hygienists may be extended "to include certain preliminary procedures in making dentures, such as taking impressions and establishing jaw relationships, but always under the supervision and direction of a registered dentist." [8]

In the Province of Alberta arrangements are proceeding between the Government of that province and the University, whereby there will be trained dental auxiliaries "who would be able to use the preventive aspects of the dental hygienist's service and at the same time would be able to take over some of the responsibility in the treatment programme." [9] It is planned that such a training course commence in the fall of 1961 and that in the first instance the auxiliaries be employed only by local health authorities.

In the opinion of the Canadian Dental Association a less desirable development has occurred in the Province of British Columbia. [8] During 1960 regulations became effective in that province whereby a limited number of dental technicians (who had previously provided services illegally) received special licences permitting them "to make, repair, reline, rebase and furnish upper and/or lower full dentures to any member of the public." However, such technicians may not construct a partial denture without the written prescription of a dentist. The Chairman of the Board of Examiners established by the Dental Tech-

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nicians Act of British Columbia states – "Their premises will be inspected, their advertising controlled and their competence checked. No new applications (after 15th September 1960) will be accepted and no increase in staff will be permitted. The Board will take over the enforcement of the regulations" [10] (i.e. the suppression of illegal dental practice by dental technicians). The dental profession of Canada watches with active interest the future outcome of this proposed method of solving a most difficult problem.

DENTAL PUBLIC HEALTH PROGRAMS

The Dominion of Canada was established by the British North America Act of 1867. Following the English Public Health Act of 1875, the provinces of Canada enacted legislation accepting responsibilities in public health. In 1919 was established a Department of National Health and by the legislation bringing it into being it was "expressly stated that the Department shall not exercise any jurisdiction or control over any provincial or municipal board of health or other health authority operating under the laws of any province." [11]

School dental services were first instituted in the larger Canadian cities such as Montreal, Toronto, Vancouver and Winnipeg as early as 1917 but dental public health in its present concept commenced in 1945. In that year, consequent to requests of the Canadian Dental Association, there was established at the School of Hygiene of the University of Toronto a course leading to a Diploma in Dental Public Health (D.D.P.H.) the course content and requirements being rather similar to those available to physicians proceeding to the well recognized Diploma in Public Health (D.P.H.). Also in that year, a Division of Dental Health was established within the Department of National Health and Welfare.

The first provincial health department to establish a dental health division was Ontario in 1925. However, it was not until after the inauguration of the Canadian National Health Grant Program in 1948 that this pattern was extensively followed in other provinces. By 1959 all ten provinces of Canada had appointed a provincial dental director, each with appropriate post graduate qualification.

Throughout this period the Canadian Dental Association provided stimulation, guidance and assistance toward the development of dental public health programs throughout Canada.

However, under the circumstances described above, it has been but natural that many varied approaches have been made toward the solution of dental health problems in different areas of a country so large and with local conditions so diversified. Therefore, we include hereunder very brief descriptions of some of the dental public health activities at the national level and in each of the ten provinces.

Department of National Health and Welfare.

Perhaps the major contributions to date have been the most excellent and continuing studies on the results attained by the fluoridation of the Brantford water supply, compared to the control cities of Sarnia and Stratford. Brantford was one of the first communities in North America to commence fluoridation (June 20th, 1945). The reports of these studies with their most careful statistical evaluations have earned their author, H. K. Brown, international recognition.

In addition this division has carried out research regarding the effectiveness of topical fluorides and the epidemiology of gingival disease among Canadian children.

Of considerable assistance has been the publication by the Department of National

Health and Welfare of excellent dental health educational aids, in the form of booklets, pamphlets, posters, film strips and films. Of particular significance has been a reference text – "Dental Health Manual" – for the use of those engaged in teaching dental health.

Newfoundland (Population: 459,000)

This, the latest Province of Canada, has two problems in dental public health with which to contend, greater than elsewhere in Canada. Firstly an extreme shortage of dentists (1:10,441) and secondly, virtual isolation from the available dental practitioners in the larger centres by many of the island's smaller fishing communities.

Dental health education is directed primarily to student teachers and nurses in training, and to younger school children and their parents. Free dental treatment is made available to all school children of 5, 6 and 7 years of age, and to those of all ages of indigent parents or attending orphanages in this province. In St. John's, the largest centre of population, in 1960 more than 50% of all such eligible children received complete dental treatment.

Nova Scotia (Population: 723,000)

Dental public health activities in this province of the Atlantic seaboard are mainly directed at education of the younger age groups in modern dental health practice.[12]

Three dental programs are in operation – mobile dental units, a dental hygienist service, and a hospital dental service to patients in institutions treating tuberculosis.

Three mobile dental units consisting of large trucks, each with complete dental equipment and a staff comprising a dentist and a dental assistant, are employed on a rural dental program (treatment and education) for children under 12 years of age. These units are employed from April to December and the staff operate the hospital service the winter months.

Seven dental hygienists provide services to pre-school and elementary school children in grades primary to VI, in village and small town schools. Each child attending has a dental examination, prophylaxis, tooth brushing and dietary instruction, and topical fluoride application except in communities where there is a public water supply. Notices are sent by the hygienist to parents whose children require further dental treatment. The hygienist service is also extended on an annual basis to student nurses in all training hospitals and to student teachers in the provincial teachers' college.

The Division of Dental Health also assists local groups in organizing dental treatment programs, stimulation of interest in fluoridation programs, and carries out dental surveys in the four communities benefiting from fluoridation.

The City of Halifax provides a school dental service which makes available emergency dental treatment to children in low-income families. In Shelbourne County there is a privately endowed free dental treatment service for all children up to Grade IV.

Prince Edward Island (Population: 103,000)

The dental public health program of this province is also partly educational and partly treatment services.

Education is mainly carried out by dental hygienists of whom three are usually on staff. They visit the schools, speak to the classes on dental hygiene, give demonstrations of the correct use of the toothbrush, try to interest the teachers in the subject, and present them with educational material. During the winter months they visit the schools in the larger centres, examine the children and send notification to the parents of treatment required.

Treatment services are provided with the help of a mobile unit, and by dentists prac-

tising in the smaller communities. Any child in Grade I or II is eligible for treatment. This program covers most of the rural areas of the province and approximately 1,500 children so benefit each year. In the two main population centres of this province are clinics for the treatment of needy children. During the summer months the dental hygienists operate clinics for the topical application of fluoride in the two main centres, and also in some of the larger rural areas. A single stannous fluoride application is provided to any child between the ages 3-13 years, but those of 6 years of age and above must produce a certificate that all other necessary dental treatment has been completed. An orthodontic clinic, for the treatment of less complicated cases operates in Charlottetown, all cases being referred by the family dentists. [13]

New Brunswick (Population: 600,000)

The Director of the Dental Division of this province serves as dental consultant to all provincial and local government departments (including tuberculosis and mental institutions) and to the voluntary health agencies of this province.

Lactobacillus count services and biopsy services were established but later discontinued due to lack of specimens from the profession.

Small dental libraries and outlines for dental lectures are provided in all training schools for nurses. Dental lectures were established in teachers' training institutions and are now incorporated in a health course given by nurses from the Health Department, who are also qualified in teaching and are now on the full-time staff at the Teachers' College.

A dental appointment system has been in use for some years by which it is possible for dental care to be carried out by private practitioners during school hours where a shortage of services requires such a procedure.[14]

Dental treatment services for needy children has been inaugurated and strengthened in eight centres. In addition dental hygiene services have been established in two Health Districts.

The dental division also cooperates with the Provincial Dental Society in many aspects including surveys and "Dental Health Days".

Quebec (Population: 5,106,000)

This, the largest province of Canada, was founded as the colony of New France in 1608 and today has a population of which approximately 80% are of French origin. About one half of the people of the province live within a fifty mile radius of Montreal, Canada's largest city.

Dental public health activities are carried out not only under the direction of the Ministère de la Santa, Quebec, but also by the Ligue d'Hygiene Dentaire de la Province de Quebec.

Of the 74 health units of this province, 60 provide dental services employing 10 full-time and 73 part-time dentists. Activities include education and examinations of school children and in some cases treatment is provided to children of "dentally poor" families.

The Dental Hygiene League originated as a committee of the College of Dental Surgeons of the Province of Quebec but in 1954 was established as an independent commission, supported by grants from the College and from the Provincial and National Governments. The League has on staff eight full-time dentists, all with post graduate qualification in dental public health.

"The League's actual programme is based on the principle of educating the educators of all categories, namely: teaching staffs, future teachers, graduate and undergraduate nurses, parents, especially mothers and expectant mothers, etc. Through these it should be possible to reach all chil-

dren."[15] In addition the League is active in radio and television (554 broadcasts in 1959) and in the use of the press (389 articles forwarded to 139 newspapers in one year.)

Ontario (Population: 6,089,000)

The Division of Dental Services of this province, whilst of course engaged in conventional dental public health activities, is also responsible for dental services in each of 18 hospitals administered by the Government of the Province and provides consultant service to the dental clinics of reform institutions. In addition the director administers a programme of emergency dental services for persons on direct relief, on behalf of the Department of Public Welfare.

To provide dental services to the children of the remote communities of the northern areas of this province, for many years two dental railway cars have been utilized. One operates on the tracks of the Canadian National Railway and the other on the Canadian Pacific Railway. Staffed by a dentist and his wife acting as his chairside assistant, these cars include not only a fully equipped dental clinic, but also living accommodation.

For the dental treatment of children of varying ages, grants (20% or 30% of the total costs) are paid in this province to local Boards of Health or School Boards. Approximately 85 Boards were eligible for such grants in 1960. These grants when instituted in 1938 were not applicable to previously established school dental services as existed in such larger cities as Toronto, Hamilton, London and others.

The City of Toronto with a total school population in excess of 112,000 has a Dental Services Division employing 39 dental officers of whom 10 are full-time. Of all children in the public, separate and secondary schools of the city, 91% were dentally examined in 1959 and of these 41% were classified as "No Apparent Dental Defects." Complete dental treatment that year was provided to some 12,000 underprivileged children of whom 87% were less than 10 years of age.

Supported by the National Health Grant Program of Canada, dental health educational programs operated in two cities and eight of the thirty-four health units of this province. In these programs eight public health dental officers, six dental hygienists and fourteen dental assistants are currently employed. That these programs can control the prevalence of dental caries to the level to be anticipated by communities having water fluoridation and in such communities to an even further degree, has been demonstrated.[16] Similarly financially supported in this province is a most comprehensive long range orthodontic research project at Burlington, an interceptive orthodontic clinic in the city of Toronto and also an experimental preschool programme in Riverdale, Toronto.[17]

Manitoba (Population: 899,000)

The Bureau of Dental Services of this province is organizing public dental activities to cover the entire province on a regional basis. Four such regions are planned each comprising three health units and surrounding territory. Three regional directors and one dental hygienist have so far been recruited. For each region it is planned that in addition to the director, who will have received post graduate public health training, there will be at least one dental clinician, one hygienist, one dental assistant and an assistant-stenographer.

Under the general direction of the provincial dental director it will be the function of the regional directors to develop dental public health programs in the broadest sense. The dental clinicians will provide treatment to preschool and Grade I students and increased coverage in isolated areas.

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Such clinical services will be augmented by the continuation of the present part-time assistance provided by general dental practitioners on a daily basis.

Although not as yet fully organized in the above manner, during the past year more than 4,000 younger children (mostly Grade I's) received preventive dental treatment through mobile and established dental clinics. In addition many older children were referred to their family dentists and much dental health education was carried out.

For the third year a most comprehensive "Dental Health Week" was carried out in 1960, in cooperation with the provincial Department of Education and the Manitoba Dental Association and with the assistance of the Bureau of Health and Welfare Education. [18]

Dental public health has played an active part in the Winnipeg school system since 1917 and now on staff in addition to the director are 2 full-time and 8 part-time dentists to serve the 50,000 school children. [19] The program includes dental health education, treatment of underprivileged children (including those mentally and physically handicapped) and studies of the dental health problems of this area. Greater Winnipeg, with a population of over 450,000 is Canada's largest city as yet benefiting from fluoridation.

Saskatchewan (Population: 910,000)

The Director of the Dental Health Division of this Province (the first in Canada to provide prepaid hospitalization, and in one region tax-supported medical care) is not only engaged in generalized dental health educational activities, but also acts as dental consultant to the Public Assistance Health Program.

In two health regions are programs each operated by a full-time dentist, and which aim to provide dental care to children up to 12 years of age.

Since 1950 twenty-two dental hygienists from this Province have been trained with the assistance of the National Health Grant Program. Only three remained in the service of the Dental Health Division at the close of 1960. Dental hygienists have been employed in five of the twelve health regions of this Province as dental health educators and to provide topical fluoride applications to children of 3 and 7 years of age. Approximately 2,000 children each year have received this service with a response of approximately 75% among the 7-year olds and 55% among the 3-year olds.

Water fluoridation is now in effect in all but three of the larger urban centres of this Province, whilst in 1958 it was reported that 35% of the urban residents were so benefiting. It is claimed that Saskatchewan rates as high a percentage of urban localities employing water fluoridation as any comparable area on this continent.

In this Province there has recently been introduced a program to provide at no cost sodium fluoride tablets to expectant mothers and preschool children in areas free of natural fluoride and with no communal water supply. [20] A future evaluation of the effectiveness of this program is being attempted. In the absence of a dental school in this Province, and in cooperation with the College of Dental Surgeons of Saskatchewan, dental clinicians specializing in children's dentistry are presented at least annually to the general dental practitioners so that they may be informed of current advances in this area of practice.

Alberta (Population: 1,283,000)

Earlier a predominently agricultural province, this province in the past ten years has shifted to one mainly engaged in mining and manufacturing. Alberta possesses more coal than the rest of Canada and also produces more oil and natural gas.

School Dental Services are provided in

the cities of Calgary and Edmonton, the former having a director with postgraduate public health training.

In the 21 local health units of this Province, six have full-time dental health officers and four others have recently budgeted for and are currently advertising such appointments. In addition five health units have part-time dental health programs and the utilization of resident dental practitioners is increasing.

The dental health services of this Province have been developed cooperatively between the Department of Public Health, the Faculty of Dentistry of the University of Alberta, and the Alberta Dental Association. Within these programs is included the utilization of third-year dental students to provide dental services under the direction of a duly qualified and licensed dentist. Also members of the Alberta Dental Association of the larger centres have agreed, as part of their professional responsibility, to visit rural areas not as yet having a population to support a full-time practice. The Department of Public Health provides on free loan sets of transportable dental equipment for such visits. The local community, through an appropriate organization, is responsible for all local arrangements necessary for the visiting dentists.

It is interesting to note that in this Province the Director of the Dental Public Health Division is also a very active member of the Faculty of Dentistry, University of Alberta as Head of the Department of Preventive and Public Health Dentistry.

British Columbia (Population: 1,606,000)

This Province, situated on the Pacific seaboard, thereby enjoys a climate unrivalled in Canada. It is the third largest province by area and by population. The ratio of dentists to population in some years is the most favourable in Canada, and in others closely challenges that of Ontario, but it is as yet without a Faculty of Dentistry within its University.

The two metropolitan areas of Greater Vancouver and Greater Victoria provide autonomous dental health services assisted by annual grants-in-aid by the Government of the Province.[21] The total school population of these areas is approximately 123,000. Their preventive dental services are on a full-time basis with 20 dentists on staff in Vancouver and 3 in Victoria (4 have post graduate qualifications). Annual dental examinations are provided in the schools, with clinical services offered to preschool, kindergarten and Grade I pupils. Of the latter group, when examined in the school year 1959/60, 45% did not appear in need of treatment, 25% were subsequently treated by their family dentist and 26% by these services – a total of no less than 96%. Dental health education is a prominent feature of these programmes and last year some 8,000 parents were individually counselled at the chairside.

To serve with the 17 rural health units of this Province are five regional dental consultants. Within all health units are organized, as an integral part of their activities, community preventive dental programmes which operate in 67 of the 73 school districts served by the health units. These programmes include dental health education at prenatal classes, well-baby clinics, during home visits by public health nurses, in the schools, with adult groups and utilization of the local press and radio. Reminders are routinely sent to parents of children reaching their third birthday, suggesting regular dental counselling and examination be commenced.

In addition, clinical services are offered to preschool and/or Grade I pupils utilizing the part-time services of 134 general dental practitioners mostly in their own offices. Topical application of stannous fluoride within these programs is being actively encouraged.

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To provide similar services to more than 40 communities without a resident dentist, there is a dental public health extern program under the direct supervision of the regional dental consultants. For these services sets of duraluminum transportable dental equipment, including air-rotor dental units have been designed and manufactured.

During the period 1958-60 dental health surveys have been carried out whereby close to 10,000 children have been examined.[22] These children represent a statistical random sample of about 98% of the total school population of British Columbia of more than 275,000. Similar surveys are planned for the years 1961-1965. The Canadian Dental Survey Manual of the Canadian Dental Association referred to above closely follows the methodology pioneered in British Columbia.

Currently being carried out is a film-monitoring survey of all dental x-ray units in this Province to detect and eliminate excessive radiation and also research projects in relation to the effectiveness of topical fluoride applications under varying circumstances.

GENERAL

Unfortunately it has to be reported that to date the acceptance of fluoridation in Canada is far from ideal. Latest reports show that only slightly more than 1,000,000 persons in some 40 communities are as yet so benefiting.[23] In the Province of Ontario no further installations are permissible pending the publication of the findings of a Royal Commission. In British Columbia in each community a public referendum is necessary; more than two-thirds of the voters have to be in favour to carry.

This lack of acceptance is of considerable concern to the Council on Public Health of the Canadian Dental Association. Provincial Dental Associations, local dental societies and the Health League of Canada have, over the past years lent considerable support to this proven preventive measure. Continuing progress is being made but at a rate as yet disappointingly slow.

However, the official and voluntary health agencies of this country together with the Canadian Dental Association and its corporate members and the six Canadian Dental Schools, have clearly and unequivocally demonstrated their sense of responsibility toward solving the dental health problems of Canada. Improved ways and means will assuredly evolve in the years ahead. To this end active research is being conducted.

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BIBLIOGRAPHY

1. Canadian Sickness Survey, 1950-51, Special Compilation No. 1; Page 6; The Dominion Bureau of Statistics and The Department of National Health and Welfare, Ottawa, 1953.
2. Survey of Dental Practice – 1958, J.C.D.A.; 25:772, 1959.
3. Council on Public Health, J.C.D.A.; 26:679, 1960.
4. Statistical Data re Canadian Dentists, J.C.D.A.; 26:218, 1960.
5. Bureau of Economic Research, J.C.D.A.; 26:558, 1960.
6. The Dental Students' Register, J.C.D.A.; 26:149, 1960.
7. The Association. Highlights from the C.D.A. Annual Meeting, J.C.D.A.; 26:677, 1960.
8. Transactions of the Canadian Dental Association, 1960. To be published.
9. Somerville, A. Dental Auxiliaries in Alberta, Can. J.P.H.; 51:433, 1960.
10. Schrum, G. M. Correspondence, British Columbia M.J.; 2:772, 1960.
11. The Federal and Provincial Health Services in Canada, Preface, Defries, R.D., Can. Pub. Health Ass'n., Toronto, 1959.
12. Dawson, W. G. The Nova Scotia Program, Dental Health News Letter (Department of National Health and Welfare); 1,1:4, 1958.
13. O'Meara, B. J. An Orthodontic Program for the Island, Dental Health News Letter; 1,2:13, 1959.
14. Langstroth, R. S. Dental Appointments in School Hours, Dental Health News Letter; 3,2:13, 1960.
15. McCabe, C. A. E. Dental Health Education in Quebec, Dental Health News Letter; 1,2:6, 1959.
16. Coburn, C. I. and Grainger, R. M. Health Education in Relation to Dental Care Needs and Demand, J.C.D.A.; 23:5, 1957.
17. Compton, F. H., Burgess, R. C., Mondrow, T. G., Grainger, R. M. and Nikiforuk, G. The Riverdale Pre-School Project, J.C.D.A.; 25:478, 1959.
18. Connor, R. A. Dental Health Week in Manitoba, Dental Health News Letter; 2,1:10, 1959.
19. McCormick, C. H. Dental Services for Children, City of Winnipeg Health Department, Dental Health News Letter; 3,2:8, 1960.
20. Chegwin, A. E. Sodium Fluoride Tablets for Rural Saskatchewaners, Dental Health News Letter; 2,1:9, 1959.
21. Sixty-fourth Annual Report of the Public Health Services of British Columbia, 1960, Victoria, B. C. To be published.
22. British Columbia Dental Health Surveys 1958-1960, Special Report No. 52, Division of Vital Statistics, Government of British Columbia, Victoria, B. C., 1961.
23. Municipalities with Controlled Fluoridation – Jan. 1960, J.C.D.A.; 26:221, 1960.

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Dental Health Problems And Programs In Latin America: An International Perspective

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A common mistake made in writings and comments about Latin America is to treat it as a block of homogenous countries. The twenty independent republics which compose Middle and South America speak three different languages, (Spanish, Portuguese and French) and have a combined population of over 200 million people growing at a fast pace. They have certain similar problems, but differ considerably in the degree of progress made toward their solution. Some countries, like Argentina and Brazil, are proceeding fast towards industrialization; others are still exclusively dependent on an agrarian economy and on old systems of land tenure to provide for the needs of their people. All of them feel an urgent need for economic development and a strong desire for improved living standards. Governments, with the assistance of international agencies, are actively engaged in studies of natural resources, in expansion of electrical capacity, the development of other sources of energy, and in long range plans for economic development. The need for increased economic cooperation among Latin American countries is fully realized, and recently a common market binding together several Latin American countries came into being. Social progress is accompanying economic development, and health services are being expanded within the framework of governmental and social security services. Chronic underemployment, poor living conditions, explosive population growth, consciousness of underdevelopment and an increasing awareness that the situation can be remedied lie at the base of much of the political unrest in some South American countries.

It is within the framework of this economic, social and political situation that I will briefly comment on some aspects of the dental health problems and programs in Latin America, especially with reference to the work of international agencies. To keep this paper within a limited size, it will be imposible to avoid some broad generalizations, even realizing how dangerous they are.

First let me comment on oral health problems. All known facts point to dental caries as our greatest South American dental problem. We have no areas such as exist in India, where the periodontal problem deserves more attention than the caries problem.

Only in the last ten years the DMF index came to be used more extensively in the Region. However, the data available are not yet sufficient to give us an overall view of the epidemiology of dental caries. Data from most urban areas indicate a medium to high prevalence of dental caries. By high, I mean a DMF of 10 or more at 12 years of age. Low prevalence zones are known to occur, but are imperfectly delimited. For instance, there are low prevalence areas in the Santa Fe province in Argentina associated with high fluoride content of drinking water. There is an exceptionally low caries prevalence area in Northeast Brazil associated with factors not yet identified. Among populations of African origin in the Carribean area and among certain indian populations, a lower prevalence is frequently found, probably related to dietary and racial factors. It is interesting to note that in most low prevalence areas, in the absence of standards for comparison, there is

the common feeling that the caries problem is very serious. A great disproportion between needs and resources permits dental caries to progress unchecked, with the usual sequence of pain and infection. High prevalence groups with more adequate dental care very often give the impression of having less caries when caries statistics are not available.

The need for dental care among public school children, is most often studied; here it may be said that by the age of 12, when most children are almost through primary school in Latin America, the bulk of dental treatment needs remain unmet. Using the percentage of filled teeth in relation to the total number of teeth attacked by caries as an indicator, I would say that a situation where 35 to 40% of the needs are met, as found in some metropolitan areas like Buenos Aires and Sao Paulo, is considered very good. There are some very good incremental dental care programs going on in certain areas of Brazil where a much higher percentage of filled teeth would be found, but the situation would not be representative of the country as a whole. Most commonly, cities which are still better off would meet from 5 to 20% of their care needs. In schools in the capital of a Central American country, where 80% of the dentists of the country are concentrated, the percentage of filled teeth in 12-year olds was found to be 4.1%. In a large school of a suburban area in another capital it was found that only 1.2% of permanent teeth attacked by caries had been filled by age 12.

As we get away from the larger urban centers, the situation becomes more and more serious. In a small city in the last country mentioned, the situation was six times worse; only 0.2% of permanent teeth had been filled. Of course, situations with 0% treated caries are not rare; it would be only a matter of doing surveys to find them.

In brief, we are barely beginning to meet the treatment needs of school children. The scratch on the surface may be a little deeper here and there, but it is still a scratch only.

Certain conclusions are inescapable if one wishes to look realistically at the problem. Let us take a look at the manpower situation. In only one quarter of the Latin American countries the "population per dentist" ratio is better than 3500. In one half there is one dentist for a population ranging from 7000 to 21,000. In the remainders, the range would be 1 to 21,000 or 30,000. When the "population per dentist" ratios are analyzed side by side with several indicators of levels of living, we see a notable consistency in the number of dentists in a country and the general living standard of its population.

One talks very loosely about shortage of dentists. Of course, there is a tremendous shortage in relation to the total needs of the population. But let us remember that it is not the total *need* which determines the size of the profession in a country, but the actual *demand* for dental services. Dentistry in Latin America is a liberal profession practiced within the framework of a free enterprise economic system. When the actual demand for dental services decreases to the point where many dentists are underutilized, and when no plans are developed to bring into the picture the potential demand, the profession will not grow in numbers, regardless of the amount of unmet dental needs. In a country which is in the most unfavorable situation, having about fifteen times less dentists than the country in the best situation, the overall ratio is 30,000 persons per dentist; the ratio in the capital is 3,500 and in the rest of the country is 100,000 per dentist. Even in the capital there is underutilization of dental manpower, as may be seen by finding dentists sharing the same dental office and delaying mar-

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riage after a number of years in practice for economic reasons. There is no inducement for practice in several parts of the country; about 15% of the dentists have preferred to migrate to other countries rather than settle in communities in their own country, which remain without any dentist.

Let us take the second best country in Latin America from the point of view of manpower. There we find 2,500 persons per dentist in the country as a whole, and less than 1,200 persons per dentist in the capital. Yet in this optimal situation, we find that only a little over one-third of the treatment needs of school children in the capital are being met. Therefore, even the best ratio is not enough to provide adequately for the needs of the child population.

Based on data collected in well organized incremental care programs in Latin America in medium to high prevalence areas, we will expect a full-time dentist to be able to have about 800 children under maintenance care. This figure from public services shows the discrepancy between dental manpower available from what is needed to provide the most simple type of dental care, consisting of fillings and extractions. It also shows that complete dental care must be expensive because of the large amount of professional manpower it absorbs, regardless of whether the care is provided under a private practice, government sponsored or third-party system. A substantial amount of treatment in the countries with less dental manpower is provided by illegal dental practitioners. In one country which I visited recently, about one third of the population lives in departments (equivalent to states) without any qualified dentist. The overall picture is one of accumulation of a tremendous amount of unmet dental needs in a large segment of the population; a relatively small segment, its size varying considerably from one country to another and in different areas of the same country, receives adequate services in private practice, where a balance between supply and demand has been established.

Let us discuss now what is being done or proposed to improve this situation by the countries themselves. Oversimplification of the problem is often made. Some dentists will tell you: the people are not educated to the value of dental services; we need an intensive campaign of public education on dental health to fill the dental offices; the overflow will force the authorities to build new dental schools or expand existing ones to train more dentists. Others will tell you: what is needed is the creation of positions with good salaries for dentists in the health services of areas deficient in dental manpower, to take care of low-income groups. Existence of jobs with good salaries will stimulate an increase in the available dental manpower.

There are fallacies in both proposals. The first one assumes that the barrier for wider utilization of dental services is educational, and that massive campaigns are sufficient to change values attached to dental health. The second one expects that governments in countries with a small income per capita can supply funds to provide dental care for the large segment of the population which cannot afford to pay a private dentist.

The same social philosophy of free enterprise and competition applies to the health professions in Latin America as in the United States. The responsibility for health maintenance falls upon the individual, his family, and the local community and the central government, in this order. Public funds will be brought into the picture when preceding levels of responsibility fail. It is obvious that in a rich country the group which needs support is small. In a poor country, where a substantial part of the population cannot afford health care, the burden which falls on government is

enormous; the country being poor, the government is called to do more things for more individuals than in rich countries. We may say that the difference in dental public health practice in the United States and Latin America is more of a quantitative nature than that of a difference in basic philosophy. It is natural that public funds will not be enough in poorer countries to provide for health needs. It is also natural that public funds will have to be distributed among several areas of government activity and that only a fraction will go to health services. It is natural also that priorities will have to be established in the health field, and health problems dealing with survival will receive more attention than those where life is not at immediate risk. It is natural also that in countries where a great segment of the population is in need of dental care from public sources, we will find the greatest limitation of public funds for dental health programs.

The "population per dentist" ratios which gives us an idea of the amount of dental services available in private practice, may serve also as an indicator of the amount of dental services that we may expect to find in public or social services. It would be unrealistic to expect a larger allocation of public funds for dental care in the poorer countries. This could come only from a strong movement of public opinion exerting pressure upon government. But public opinion is not sufficiently motivated to fight for improved dental care because it is at the same time faced with the more serious problems of survival, food, shelter, and employment. It is therefore natural that only services of an emergency nature, extraction of teeth, alleviation of pain and treatment of infection are made available through the limited health services of the poorer countries.

The point which I am trying to make in regard to dental care in South America is that in countries where the needs are greatest, the chances are smallest for early improvement of the situation.

In the face of the magnitude of the caries problem, producing lesions so expensive to repair, mass prevention would offer the best possible approach. The progress of water fluoridation has been very slow, but is gaining some momentum in recent years. The first project started in 1952 and 1953, in Venezuela, Chile, Brazil and Columbia. There are now 23 water fluoridation systems in operation, and 19 others are being planned to start in the near future.

There has been no organized opposition to water fluoridation in Latin America. Delay in progress is mostly due to economic difficulties. Chronic shortage of foreign currency for importation of the salt and equipment needed make difficult the allocation of funds for a measure which is not considered of high priority either by public opinion or by the authorities in the countries. In some countries organized dentistry has given active support to the promotion of fluoridation, but in others the support has left much to desire.

The possibility of using fluorspar in some water fluoridation plants, at one third the original cost, may reduce the economic barrier to fluoridation. Fluorspar is abundant in Latin America and would eliminate the need for importation of chemicals in many countries. Stronger professional and public support however, is necessary for broader use of fluoridation.

Obviously, even under the best circumstances water fluoridation can be made available only to a small segment of the population. Water of good quality and in adequate quantity is still one of the basic problems of Latin America, and one in which the Pan American Health Organization is now actively engaged. Thousands of small communities still lack a public water supply system. There is a great need

for the search of alternative vehicles for supplementation of fluoride in the diet, even knowing that nothing would offer more advantages than public water fluoridation.

Topical applications of sodium fluoride have been used in several community school programs in Latin America with good results. There is no doubt that it has a place in well organized programs and in private practice. Budgetary limitations and a certain resistance of the profession to the use of auxiliary personnel for topical applications has reduced to a minimum the utilization of this method in public health programs.

With limited preventive programs, the public health dentist in Latin America becomes deeply involved in the actual operation of dental care programs. Some services are of a considerable size; for instance, the School Dental Service of the State of San Paulo has over 1300 dentists. Other services, although country wide, are very small; in some the total manpower available may amount to the equivalent of ten full-time dentists. Large or small, two major problems upset the dental administrators: priorities and productivity.

Priority is the argument he constantly hears from the medical public health administrators whenever the matter of allocation of resources among several health activities is discussed. Some programs get a fair share of the health budget, but others lag considerably behind. Priority is also the argument that he has to use with his colleagues doing clinical work when he has to limit the services rendered either to extractions only, or to extractions and fillings. He continually receives pressure to establish specialty clinics when resources are barely enough for the most urgent and simpler types of services. It is always the question of whether to give fairly complete services to the few or simple essential services to the many. This last alternative is the one defended by the public health dentist, and not always is it well accepted by the dental clinicians. The lack of scientific stimulus in the repetitive performance of the most simple dental operations creates a problem for dentists eager to advance in the profession and generates dissatisfaction on the job.

Productivity is the second big headache of the dental administrator. In many clinics rendering only extraction services, productivity is exceptionally good; very frequently it is at acceptable levels. The problem usually lies in the performance of operative work. There are clinics where productivity may fall to very low levels, and many times it is associated with low salaries and deficiencies in equipment and supplies. A vicious circle is established where health administrators resist a raise of salaries and improvement of facilities because productivity is so low; and clinicians feel that the amount of work being rendered is consistent with salaries received and refuse to increase it.

The two problems, priorities and productivity, handicap greatly the efficient operation of dental services. Eliminating variety in dental work by limiting it to simple services and reducing the economic incentive by fixed salaries, the dental administrator is put in a very difficult position to obtain and maintain an acceptable productivity level. I have no doubt that the fee-for-service system at a level compatible with remuneration in private practice would step up considerably the productivity in many services. This system, however, is incompatible with civil service regulations in practically all countries and would only have a chance in certain social services, outside the governmental sphere. As a matter of fact it is gradually being introduced in some social and industrial services jointly financed by employers and employees in certain Latin American countries.

Let us now take a look at what the international agencies have been doing in the dental field in Latin America. Assistance has been rendered principally through three types of institutions; multilateral, bilateral and philantropic. I do not intend to mention all of them, but only the three which have been more active: in the multilateral field the World Health Organization (WHO) and the Pan American Health Organization (PAHO) through their executive arm, the Pan American Sanitary Bureau; in the bilateral field, the point IV program of the United States Government, conducted through the International Cooperation Administration (ICA); in the philantropic field, the W. K. Kellogg Foundation. The Foundation has been active in Latin American dentistry since the early forties and has concentrated its attention on assistance to dental schools. The ICA dental program has helped many countries in the training of personnel, in water fluoridation, and has provided special consultants in the education and public health fields. Some especially successful dental programs have been developed in bilateral-type programs.

The dental program of PAHO started in 1955, with the assignment of the present Adviser in Dental Health to the Washington Office. The same problems of priorities which operate at local and national levels do also operate at the international level. This Region is the only one among the six WHO Regions which has a dental adviser on its staff. Expenditures in program activities are limited for budgetary reasons. The most important activity developed so far has been in the area of training dental public health administrators for Member Governments. Until 1957 the School of Public Health of the University of Michigan has supported most of the load of the training of public health dentists for Latin America. Since 1958 the WHO and the Kellogg Foundation have been assisting the University of Sao Paulo in developing an international dental public health training program for Latin America. This program, now in its fourth year of operation, has received dentists from 18 of the 20 Latin American republics, under WHO fellowships. Fifty-seven dentists were trained in the first three years, in two types of courses. One, of one-year duration, equivalent to the course leading to the "Master of Public Health" degree in the United States, aims at the preparation of dental public health administrators and teachers of public health in dental schools. The other, lasting nine-weeks, is a course of orientation in dental public health for dentists working at the local level.

In addition to the School of Public Health of the University of Sao Paulo, other schools of public health in Latin America are offering public health training to dentists, among them the schools in Buenos Aires, Santiago, Bogota, Mexico and Puerto Rico. In most countries of the Region there is growing interest among dentists working in the health services to study public health in order to be better prepared for their work. The concept of dental public health as one of the specialities of dentistry, offering unusual opportunities of service to the community, is now firmly established. In 11 of the 20 countries there are already formally trained public health dentists occupying advisory or directing positions at the national level.

The intensive program of training of public health dentists represents only a first stage in a long-range program. In the second stage, now being initiated, activities will be concentrated in the training within the countries, of the professional and auxiliary personnel already working in care programs in the health services. These training activities will be conducted by national personnel with public health training and supported, as needed, by international organizations.

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Two broad areas of great interest to dental health are open to international assistance: education and research. Seventy-three dental schools in 19 countries, some just average, some rather weak, present a wide variety of problems. In some countries the number of graduates is too small (an average of 4 to 5 per year) and about 80% of the students starting the course do not complete it. In others, first year classes are too big with hundreds of students, limiting the amount of practical work that can be done by each individual student. Problems related to selection of students, curriculum organization, teachers' training, teaching methods, and liberal education of the future dentist are some in which the schools are now interested and where international assistance could be concentrated.

In the area of research there is also a wide open field. We need better knowledge of the epidemiology of dental caries and periodontal diseases in the Region, to mention only our two most important dental public health problems. Operational research is needed not only to establish fair standards for performance, but also to find more efficient ways of rendering professional services and of utilizing auxiliary personnel. In the area of applied research, we certainly need to find alternative methods of fluoride supplementation in the diet and improved mass-methods of caries prevention.

For the development of dental programs at the international level, the active support of organized dentistry in each country is essential. The delegates of the countries to the directing bodies of the Organization determine its policies and approve its budget. The Federation Dentaire International is always standing by, collaborating and assisting WHO in carrying out its program. However, it is at the level of each country that organized dentistry needs to make its voice heard to make the delegates of the country interested in the dental program.

Politically, we are now in a phase of reaffirmation of Pan American ideals. The Latin American dentist has sincere admiration for his North American colleagues, who more than any other contributed to the elevation of the profession to the high scientific and technical level it has reached today. It is necessary to stimulate the interchange of ideas, strengthen the contacts and integrate the efforts. The American Dental Association intends to devote special attention in its annual meeting in Miami in 1962 to Latin American relations. This would be an opportune moment to plan a strategy to attack the problems which dentistry is now facing in its efforts to render more and better dental services to the people of this Hemisphere.

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This paper was read at the meeting of the Cleveland Dental Society celebrating its 21st Annual "Children's Dental Health Day," on January 30, 1961.

Some Aspects Of Dental Public Health In Argentina

Dr. Simon Katz

To present a panoramic picture of Argentina's status in the field of dental public health is not an easy task. Argentina is a big country, (over 2 and ¾ millions square km) organized on a federal basis.

The responsibility of caring for the public health lies mainly with the local authorities, and in most provinces the organization of dental public health is in its first steps. As far as the author knows, only a few accurate and reliable partial surveys have been made, and there is a lack of adequate data upon which a scientific plan of action could be based.

The author should prefer, therefore, to comment on some general aspects, and to discuss later the school dental health picture in the City of Buenos Aires, which he knows better.

The points he should like to present are:

1. The ratio of dentists/population in the whole country is 1/2000; but the distribution of dentists throughout the country is very uneven *(Fig. 1)*.

The ratio is 1/800 in the City of Buenos Aires, 1/1700 in the province of Buenos Aires, 1/8000 in Catamarca, 1/2200 in Cordoba and Santa Fe, 1/3800 in Corrientes, 1/11000 in Chaco, 1/4000 in Entre Rios, 1/13000 in Formosa, 1/5600 in Jujuy, 1/9500 in La Pampa, 1/6400 in La Rioja, 1/2900 in Mendoza, 1/8400 in Misiones, 1/18000 in Neuquen, 1/4100 in San Juan, 1/8200 in San Luis, 1/10000 in Santiago del Estero, 1/6000 in Tucumán and in Patagonia 1/35000. (Data of 1956) [1.-2.]

2. There are only four university dental schools in a country of more than 20 million people. As a result, the number of students in each is very high, and the difficulties of teaching greater than normal. For example, 1,200 students enter each year the first year course of the Faculty of Dentistry, University of Buenos Aires, and the total number of students in the five years curriculum is approximately 3200.

3. Broadly speaking, neither dental public health nor preventive dentistry are taught as separate subjects of the dental curriculum, although occasional references are made to it.

4. Until recently, only one course in dental public health was given in the Faculty of Hygiene and Preventive Medicine, University of Litoral. In this limited 1 year course, both professors and pupils worked part time. In 1960 courses began in the School of Public Health, University of Buenos Aires. A complete, full time course of dental public health is now given to 8 graduate dentists.

5. At present, that is, without counting the students of the new School of Public Health, only three M.P.H. dentists are working in Argentina: Dr. A.E.Heer, graduated in Michigan, head of the Department of Dentistry, Province of Santa Fe, and consultant to the Department of Dentistry, Province of Buenos Aires; Dr. A.V. Garat, working in Chaco, and Dr. Ch. B. de Di Pasquale, professor of Dental Public Health, School of Public Health; both graduated in Sao Paulo. A few dentists have received their degree in the Faculty of Hygiene and Preventive Medicine, University of Litoral.

6. The number of pedodontists and school dentists is very small. In Catamarca there is one school dentist to treat 50,000 school children. The City of Buenos Aires has 80 official school dentists, and a school population of nearly half a million children. The last but not least important point is the rate of the occurrence of dental disease in Argentina.

Fig. 1. Population per dentist in different areas of Argentina

As was said above, only few reliable surveys have been carried out in Argentina. Under Heer, the Department of Dental Public Health, Faculty of Hygiene and Preventive Medicine, has studied the occurrence of dental caries in different areas of the Argentine litoral.

In a study of 803 school children of the City of Santa Fe. (fluoride free water) Heer[3] found 0.7 D.M.F. permanent teeth in six year old children; the average D.M.F. per child rises up to 7 in 14 year old children. In Esperanza,[3] (fluoride content of drinking water 0.8) the average D.M.F. in 677 children was negligible in 6 year old children, but rose to 2 D.M.F. in 14 year old children.

In measuring the prevalence of caries in primary teeth, Heer and co-workers[3] found in a study conducted in 1956 on over 808 Santa Fe children, that 2.5 out of the four 2nd. deciduous molars were affected, and that one of them was either extracted or indicated for extraction. A great difference was also found in the caries experience in deciduous teeth of children living in Santa Fe and Esperanza; the def rate in Esperanza was 1.66 in 4-year-old children, rising up to 3.22 in children 5 years old, and declining gradually to 0.06 def teeth in 13 year old children.

Molina[4] found the following values for def teeth of children living in Santa Fe:

Age years	def Teeth per Child Santa Fe	Esperanza
7	7	3
8	6	2.7
9	3.2	2
10	1.9	1.5

A pilot study conducted in 1957 compared school children living in La Plata and neighboring populations (fluoride 0.5 – 0.6 ppm) and the City of Buenos Aires, (fluoride free water). Recording the D.M.F. and def of the left lower permanent and second deciduous molars, Katz[5-6] found a significant difference between La Plata children and those of the City of Buenos Aires. La Plata and Buenos Aires are about 40 miles apart, across the River Plate coast.

In 1951 a change was made in the La Plata water supply system; the well water (fluoride 0.5–0.6 ppm) that had been used was replaced by river water, which was fluoride free. The change began in the neighbor populations and is going on progressively. The figures of the 1957 pilot survey show the increase of caries experience in children living in Ensenada, one of the first populations served by the fluoride free water who were born after the water change. Table I summarizes the findings of that survey.

TABLE I

Caries experience in first permanent and second deciduous molars[a] in children living in La Plata, (fluoride 0.5–0.6 ppm), Ensenada (fluoride in drinking water prior to 1951 0.5–0.6 ppm, and fluoride free water since then) and Buenos Aires (fluoride-free water), 1957.

Age last birthday	D.M.F. first permanent molars, per child			Affected[b] second deciduous molars, per child		
	La Plata	Ensenada	Buenos Aires	La Plata	Ensenada	Buenos Aires
6	.2	1.5	1.2	1.6	3.4	2.7
7	.36	1.5	1.8	1.5	2.5	2.8
8	.9	2.2	2.4	1.5	2.1	2.8
9	1.1	2.0	2.9	1.2	1.0	2.8
10	1.3	2.2	2.9	1.0	1.2	1.5
11	1.1	1.8	3.1			
12	1.3	1.7	2.9			
13	1.1		2.9			

a. Estimated from caries experience of lower left side.
b. Extracted teeth which according to the age of the child should have been in the mouth, were also counted. Affected teeth = def + extracted teeth.

Dental Care in Argentina

Data on dental care on a public health basis are also rarely available in Argentina. Heer's[7] studies do reveal a percentage of filled teeth ranging from 5% for areas outside of urban centers up to 30% in developed cities such as Rosario and Santa Fe.

In studying the dental status of children living in La Plata and neighboring populations, it was found[5-6] that only 15 to 24% of affected first permanent molars were treated; when measuring the degree of treatment of deciduous second molars, figures ranging from 0.0 to 15% were found; this being a common finding in all surveys known to the author.[8] It is apparent therefore, that a low value is assigned to the preservation of primary teeth. In 5 year old children living in Esperanza, with an average of 3.2 def teeth per child, only 0.2 tooth per child was found filled.

Public Dental Services in Argentina

"Free public dental services" states Dr. Heer[7], "are very generously distributed around the country," but "there does not exist a uniform policy for rendering dental services to the population"; the assistance, with a few exceptions, is not based on scientifically planned programs according to the dental needs of individual groups of the population. No evaluation of the results is made, and the recording of data is confused and deficient; the cost of common services, such as extractions and fillings could not be calculated for lack of proper records.

Public dental offices are, in general, poorly equipped and supplied, and extractions are the most commonly rendered service. Heer[7] points out that 70% of the fillings he found in children living in Santa Fe were made in private offices.

The School Dental Health Programs in the City of Buenos Aires

The responsibility of caring for the health of school children on a public health basis in the City of Buenos Aires, is assigned to a specific Department; the Dirección Nacional de Sanidad Escolar. Its Division de Odontologia is charged with supervision of the dental health of the school population; its activities follow examination of every pupil; render dental services to the pupils requiring them, and give adequate dental health education to pupils and parents.

Serious efforts are being made to put the services rendered by the Division on a scientific basis. The first step is research on the manner in which dental disease occurs, and the collection of information concerning the characteristics of the disease.

In order to plan a program to meet the dental needs of the school population, taking into account the available resources, an epidemiological survey was conducted in 1960. Three dental diseases were measured:

1. *Dental caries* using the D.M.F. and def indices;
2. *Periodontal disease*, using a modification of the Ramfjiord[9] index, proposed by Dr. J.J. Carrara;[10] and
3. *The handicap produced by malocclusions*, using Draker's H.L.D. index.[11]

Both the periodontal and malocclusion surveys must be considered as preliminary studies conducted to test the practicability of the method, and to subject the indices to field trial. The results obtained will be used as a base for future studies.

The caries experience survey was conducted on nearly 2500 children from 6 to 13 years old. It is felt that the results as summarized in tables II and III are representative of the whole school population.

XUM

TABLE II

Caries experience in permanent teeth of 2484 Buenos Aires school children – 6 to 13 years old, 1960.

Age last birthday	Number of children	D	M	F	Total DMF	DMF per child
6	282	206	11	35	252	0.8
7	332	446	30	117	593	1.8
8	315	479	50	198	727	2.3
9	341	623	76	315	1004	2.9
10	372	597	101	398	1096	2.9
11	355	735	125	478	1338	3.7
12	337	904	181	597	1682	5.0
13	150	375	128	267	770	5.1
TOTAL	2484	4365	692	2405	7462	3.0

TABLE III

Caries experience in deciduous teeth of 1642 Buenos Aires school children – 6 to 10 years old, 1960.

Age last birthday	Number of children	d	e	f	Total def	def per child
6	282	638	313	175	1124	4
7	352	615	433	270	1318	4
8	315	469	346	359	1174	3.4
9	341	302	265	237	802	2.3
10	372	115	137	128	380	1
TOTAL	1642	2139	1492	1167	4798	2.9

XUM

Gingivo-periodontal diseases were measured in 600 students, 300 boys and 300 girls, 8 to 16 years. According to Carraros's simplification of Ramfjord[12] index, the gingival status, materia alba and calculus of four groups of teeth: namely, right upper and left lower central incisors and the right upper and left lower first permanent molars, were recorded. The degree of inflammation is presumed to be related to the personal hygiene (materia alba) and to the most common cause of inflammation, namely calculus.

Numerical values ranging from 0 to 3 are used to record the quantity of calculus and materia alba, and also the degree of deviation from normal of the gingivae: 0 is considered normal; 0.25 to 1.25 mild; 1.50 to 250 moderate and 2.50 to 3 severe. Table IV summarizes the results.

TABLE IV

Gingiva, materia alba and calculus status of 600 Buenos Aires school children, 8 to 16 years old, 1960.

Age	No. of children	Gingival Index No. of children with gingivitis				Materia Alba Index No. of children with mat. alba				Calculus Index No. of children with calculus			
		normal	mild	moder.	sev.	free	mild	moder.	sev.	free	mild	moder.	sev.
8-10	200	46	144	10	0	25	167	8	0	160	40	0	0
11-13	200	34	144	20	2	12	169	18	1	129	71	0	0
14-16	200	55	127	17	1	31	149	20	0	123	77	0	0
TOTAL	600	135	415	47	3	68	485	46	1	412	188	0	0

These figures are showing that 77% of the children have some degree of gingivitis, and that near 90% of them show some lack of hygiene. It is assumed that a better method of tooth brushing will contribute to improvement of the gingival status of children.

The handicap produced by malocclusions were measured using Draker's HLD index.[13]

450 children, 6 to 15 years old, were divided into 3 groups, in the following manner:

Group 1: children with mixed dentitions, and incomplete eruption of incisors.

Group 2: children with mixed dentitions, and complete eruptions of incisors.

Group 3: children with permanent dentitions, except third molars.

Results are summarized in Table V.

TABLE V

H.L.D. Score
Distribution of 450 Buenos Aires school children, 6 to 15 years old, 1960.

H.L.D. score	Total No. of children	No. of children by dental age group 1	group 2	group 3
0	129	54	28	47
1-6	199	54	75	70
7-12	94	35	32	27
13-18	23	6	11	6
18-23	4	1	3	0
23 and over	1	0	1	0
TOTAL	450	150	150	150

According to these figures, 28% of the examined children showed no deviations; 93.8% had a score under 13; and 6.2% a HLD score of over 13, that is a handicap which is believed to require prompt treatment.

Analyzing the figures of the survey, a great backlog of dental needs is found. An incremental program, with a well planned system of priorities, is now being introduced.

Restoration of affected first permanent molars in children from 6 to 9 years old, will be the first goal of the division. The responsibility of caring for the primary teeth of pre-school and school children could not be assumed by the Division; instead we are planning an intensive program of dental health education directed to them. A search is on for methods leading to adequate motivation for children and parents to care for primary teeth. It is believed that active participation of children, through plays and similar activities, where they represent teeth, eruption, shedding, etc., will be a great contribution to the success of the program.[14]

Great emphasis is also being laid on preventive measures. The Division promotes fluoridation program plans and topical application of stannous and sodium fluoride.

The recent periodontal survey, showing a great percentage of children with gingivitis, is indicative of the need of promoting good methods of oral hygiene. Regarding malocclusions, the Division faces a serious and presently insoluble problem; if the figures recently obtained are confirmed by further studies, and if a score of 13 is established as the limit for eligibility in the orthodontic rehabilitation service, more than 30,000 children would require treatment. This is presently not possible. Great numbers of children are treated in private offices, but the number of applicants to public orthodontic services exceeds by far the the available resources for their treatment.

A Look in the Future

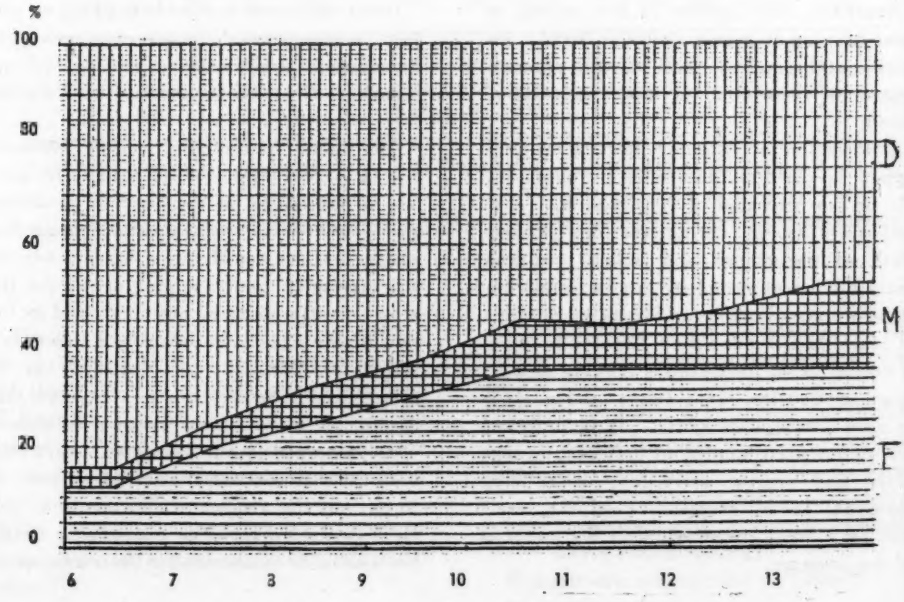
The author is afraid that he has given a pessimistic picture of the status of Argentina in the field of dental pulbic health. Some facts lead him however, to feel that a broad and brilliant future is being opened in this field.

The Department of Dentistry of Santa Fe is doing a fine job, of which, the outstanding points are as follows:[15-16-17]

The fluoridation of communal water supplies in the cities of Rosario and Santa Fe, (approved by Law of Jan. 27, 1960); distribution of fluoride lozenges in areas without communal water supplies; topical application of fluorides, dietetic control of caries using lactobacillus counts; re-organization of public dental services, on a realistic and practical basis; and an adequate program of dental health education.

Other programs are being planned; two of them in Chaco and San Juan with the co operation of Unicef and OMS; the Provinc of Buenos Aires is also engaged in a pr gram of integrated health services and ha employed a new public health dentist. Flu oridation has been approved in the City o Buenos Aires, and, in spite of the fact th various factors have delayed its start, it i hoped that fluoridation will be near reali ty in the country.

Perhaps the most important feature con cerning the future of dental public healt in Argentina is the end of the first cours of the School of Public Health of the Uni versity of Buenos Aires. 8 young an enthusiastic public health dentists are anx ious and willing of sharing their knowledg and ability all around the country; and th author is sure that is the key of a new er of scientific advances in dental publi health in Argentina.



Distribution of DMF components in 2484 Buenos Aires school children, 1960

REFERENCES

1. Heer, A.E. – Personal communication, 1956.
2. Chaneles, J. – Lecture given in the first meeting of the Asociacion Argentina de Odontologia para Nifios, 1960.
3. Heer, A.E. and Gomez Galissier B.J.–Comentario de los datos de un examen dental realizado en la Ciudad de Esperanza (Provincia de Santa Fe) Anales de Medicina Publica 5:293-310, 1953.
4. Molina, H.S. – Experiencia de caries en las poblaciones escolares de la ciudad de Santa Fe y de la localidad de Santo Tome (Prov. de Santa Fe) Anales de Medicina Publica 4:279-94, 1952.
5. Katz, Simon – Dental Status of Children living in La Plata and neighbour populations. Report presented to the Direccion de Odontologia, Provincia de Buenos Aires, 1958, Unpublished.
6. Katz, Simon – Report on the fluoridation of La Plata water supply. Presented to the Direccion de Odontologia, Provincia de Buenos Aires, 1958.
7. Heer, A.E. – Report of the dental public health in Argentina, 1956. Unpublished.
8. Katz, Simon – Aspectos sociales y economicos del problema sanitario de la caries dental. R. Asociacion Odontologica Argentina. 45:277-42, Jul. 1957.
9. Ramfjord, S.P. – Indices for prevalence and incidence of periodontal diseases - J. Period 30:51, 1959.
10. Carraro, J.J. – Personal communication, 1960.
11. Draker, H.L. – Handicapping labio-lingual deviations. A proposed index for public health purposes. Bulletin of the Amer. Ass. of Public Health Dentists 18:1-7, 1958.
12. Cardiello, E.N., Z. de Rubio, O.W. and Pujo D.E. – Gingivoperiodontal diseases in Buenos Aires school children. Report presented to the Direccion Nacional de Sanidad Escolar, Division de Odontologia, 1960. Unpublished.
13. Morales, M.E. – Handicapping labio-lingual deviations in Buenos Aires school children. Report presented to the Direccion Nacional de Sanidad Escolar, Division de Odontologia, 1960. Unplished.
14. Division de Odontologia, Direccion Nacional de Sanidad Escolar, Buenos Aires, Argentina. Report on the 1959 and 1960 surveys. Conclusions and program based on them. In preparation.
15. Katz, Simon – Basic content of a previous program of dental health education for preschool children. Presented to the Direccion Nacional de Sanidad Escolar, Division de Odontologia, 1960. Unpublished.
16. Ministerio de Salud Publica y Bienestar Social, Provincia de Santa Fe. Boletin de la Direccion G. de Odontologia, Ns. 1, 2 y 3; Enero a Marzo, Abril a Junio y Julio a Set. 1960.
17. Same as 16.
18. Same as 16 and 17.

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Dental Public Health Programs And Activities In Israel

Kurt A. Rosenzweig ——
—— *D.M.D., M.P.H.*

In an attempt to describe the program aspects and activities in Israel in the field of dental public health it appears appropriate to follow Hanlon's advice:[1] "It should always be realized that we are dealing here both with a product, health, and a recipient, the public, and that the most complete knowledge and understanding of the one is pointless without corresponding information about consideration of the other." Therefore, a few facts about Israel's population which have a bearing upon its oral health will be shortly reviewed. The State of Israel, covering an area of the size of New Jersey, was established in 1948. Since then the Jewish population has almost tripled to about 2,000,000; this was brought about by practically unlimited immigration of different ethnic groups, most of whom came without means or without professional skills from countries where communicable diseases were highly prevalent and the most elementary laws of hygiene almost unknown. These newcomers arrived in unpredictable waves in a country forced to devote a considerable part of its resources to defense.

While in the very process of absorbing the immigrants, the country had to create its own institutions, including health services, while many pressing health problems, such as malaria, tuberculosis, trachoma and others were far from being under control. On the other hand, the established population contained a comparatively large body of professional people, including dentists, reinforced by new immigrants from Central and Eastern Europe. Thus Israel has today a dentist: population ratio of about 1: 1900,[2] but the age of dentists is relatively high (mean age 48 years); two-thirds of them are concentrated in the major cities.

DENTAL PUBLIC HEALTH ACTIVITIES

Research: During the last five years a number of surveys have been carried out, in order to establish prevalence and incidence of oral disease in various parts of the population. The Ministry of Health, the Army, the School of Dentistry and other agencies participated herein, and valuable information has been collected which may serve as baseline for both planning and evaluation of programs.

Prevention: In 1954 a committee of experts had been appointed by the Ministry of Health with the purpose of investigating the possibility of fluoridation in Israel. The committee recommended to start with a controlled demonstration project. However, the realization of the recommendation met with unsurmountable difficulties. It was impossible to find two cities which would have: 1– A stable population of the same ethnic origin (it had been shown that caries experience differs significantly between various ethnic groups[3]). 2– A child population of adequate size, born and reared in the place of residence. 3– Water supplies of the same, stable fluorine content. Especially the latter condition proved impossible to comply with, since none of the larger cities had a single, central water reservoir. Practically all the water sources are interconnected by a country-wide network; local demands are met by switching

in supplies from different origin. Moreover, the mineral content including the fluoride content, shows considerable seasonal variations. Under these circumstances it would be impossible to use automatic feeders, and an almost hourly adjustment of the fluorine content would be necessary at as many as 30 different stations in Tel-Aviv alone, (400,000 inhabitants). Besides, the optimal fluorine content of water for a country with subtropical climate, where drinking habits, influence of perspiration and other factors are entirely unexplored, has not been determined.

Assuming the same conditions as prevailing in the arid parts of the U.S., it would be 0.8 ppm.[4] A survey carried out over several years showed the average F content in the three major cities, Jerusalem, Tel-Aviv and Haifa, to vary between 0.4 and 0.6.[5] Considering the low caries incidence in Israel it is doubtful whether an addition of 0.2 to 0.4 ppm to the public water supplies would result in a further reduction which would justify the effort under prevailing conditions.

For the same reason, topical application of fluoride solutions has not been introduced. The cost would be prohibitive, since dental hygienists are not allowed to practice in Israel, and applications would have to be carried out exclusively by dentists.

Health Education: Major parts of the population, especially immigrants from oriental countries, are largely unaware of the importance of dental health, and how to preserve it. A series of short radio talks to parents has been given by the head of the municipal school dental service of Tel-Aviv. In most cities during the last three years the annual "school health week" was devoted to dental health. The Ministry of Health produced a dental health guide for teachers and school nurses, which is distributed free of charge. It serves as resource material especially for talks which were given by teachers during the special campaigns. The local dental industry provided gifts and awards for the best compositions by students on dental subjects; posters and other visual aid material were used at exhibitions. Local dentists participated in giving talks at parents' meeting and a number of films were shown. This program is continued throughout the country. At present the Israel Dental Organization together with the Institute of Applied Social Research of the Hebrew University are planning a countrywide survey on the attitudes of the various population groups towards dentistry and dental health.

Care Programs: Public dental care programs for school children have been popular in Israel since the early thirties, mainly for two reasons: 1– Parents tended to neglect their children's dental health because they did not understand its importance. 2– Private dentists generally did not like to treat child patients. These reasons existed also in Europe, from where most dentists immigrating to Israel came; thus it is understandable that with the arrival of dentists from Germany, dental care clinics for school children were established in the major cities, after the German fashion. All grade school students are examined annually and if necessary treated. Although the treatment program is restricted mainly to the permanent teeth and some methods appear somewhat antiquated, this service has proved extremely beneficial. As a rule it is operated by the municipality which raises a small capitation fee for each child attending public schools. The Ministry of Health encourages the establishment of school clinics by loan of equipment and where necessary by financial grants. At present about 60 per cent of Israel's child population from 6 through 14 years is cov-

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ered by this service. These local school care programs are not centrally supervised and coordinated (the Ministry of Health has no dental division), but progress in this direction has been made by introducing a common system of recording and reporting.

The Ministry of Health provides also some dental services to the inmates of hospitals for the chronically ill. A special philantropic organization "Malben" takes care of the medical and dental needs of the aged and sick new immigrants who need rehabilitation.

The Government envisages introduction of a general, compulsory health insurance, and an expert committee has recently published its report and suggestions. A few benefits in the field of dentistry are included. While the dental profession in Israel in principle is not opposed to the idea, it has worked out counter proposals as to the kind of benefits to be provided; they feel that these should be of a preventive rather than diagnostic and curative character.

Teaching: The curriculum of the Hebrew University–Hadassah School of Dentistry founded by the Alpha Omega Fraternity, includes a 40 hours course in Dental Public Health. Concepts of community health organization, dental epidemiology, methods of control and prevention of oral disease and the social and cultural factors to be considered in the planning of programs are taught. On fixed days the students receive practical demonstration, and as final assignment they study the actual oral health problem of a certain community in its general setting, and work out the plan of a suggested program.

SUMMARY

There are some modest beginnings discernible in the field of dental public health in Israel, and it appears reasonable that in the future promotion of health and prevention will attain more attention. Prevailing urgent needs make it necessary to focus primarily on the curative phases. Only recently it has been stated that the "single, most important issue facing dental public health today" is the definition of its practice.[6] The subject is controversial, and it may be felt by some that there is little of public health dentistry in the activities presently reviewed. It is, however, conceivable, that dental public health has different meanings not only among experts in one country, but even more justifiably, in different countries in accordance with their particular situation.

BIBLIOGRAPHY

1. Hanlon, J. J. Principles of public health administration, 2nd ed., St. Louis, Mosby, 1955. 693 p. (p. 96).

2. Grushka, Theodore, ed. Health services in Israel. Jerusalem, Ministry of Health, 1959. XV+ 214 p. (p. 151).

3. Rosenzweig, K. A. Dental caries and fluorosis in Israel. Arch. Oral Biol., 2: 292-307, Dec. 1960.

4. Galagan, D. J., and Vermillion, J. R. Determining optimum fluoride concentration. Pub. Health Rep., 72: 491-3, June 1957.

5. Gedalia, Jitshak. A survey about the fluorine content of Israel domestic water supplies. Harefuah, 44: 1-3, May 1953 (Hebrew).

6. Easlick, K. A. What, in your opinion, is the single most important issue facing public health dentistry today? Pub. Health Dent., 20: 17, Summer 1960.

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Public Health Dentistry In . . . . .

India.

N. N. Bery
D.D.S., F.D.S., R.C.S.

At the advent of Independence in 1947, there was only one Government Dental College in Bombay affiliated with a Univeristy, and two private Dental Institutions (one in Calcutta and one in Bombay) and no Dentists' Act. The All India Dental Association formulated a Dentists' Act and got it sponsored by the Government of India; it was passed early in 1948. With the passing of the Dentists Act, the Dental Council of India (a statutory body by act of Parliament) was formed, which regulates the Profession of Dentistry and Dental Education in the country. Practice by unregistered dentists has been stopped under the Act.

Since the Dental Health Services are interlinked with the number of Dental Colleges and Dental graduates in the country, I give, therefore, a brief history of both. The Government Dental College in Bombay was teaching the B.D.S. course, while two private Dental Institutions were giving a Licenciate Course (L.D.Sc.). The Dental Council of India abolished the Licentiate Course and had the two Dental Institutions affiliated with Universities; a uniform B.D.S. Course (Bachelor of Dental Science) in all Dental Colleges was the result.

In the First Five Year Plan (1951-56), new Dental Colleges were opened at Amritsar, Lucknow and Madras, and in the Second Five Year Plan (1956-61) additional new Dental Colleges at Patna, Bangalore, Hyderabad, Trivandrum, and Patiala came into existence. In the short span of 13 years, we have to-day 11 Dental Colleges, and it is proposed to open 5 more in the Third Five Year Plan (1961-66).

At present we are graduating about 200 Dentists every year and hope that by the end of the 3rd Five Year Plan we will have 400 graduates every year. The 6 Dental Colleges existing in the First Five Year Plan, now have new buildings, new equipment and increased staff and have doubled their capacity of admissions. The 2 Dental Colleges in Bombay have increased their admissions from 30 each to 60 and 100 annually.

A Post-graduate Dental Teachers' Training Course, leading to a degree of M.D.S. (Master of Dental Science), was started at Bombay in 1959, with the Government of India giving 42 stipends per year. This will overcome the shortage of teachers in this country.

Under the W.H.O., Colombo and Commonwealth Scholarships, teachers are sent out every year for higher training abroad; the Heads of the Dental Institutions are sent out to different parts of the world to study new administrative and technical developments in Dental Colleges of repute.

It has been recommended to the Government of India to start a Diploma Course in Public Health Dentistry during the Third Five Year Plan. This plan has been accepted by the Government of India; depending upon the funds available, post-graduate training in Public Health Dentistry will be given. When approved by the Government, post-graduate education in Public Health Dentistry will be started at the all India Institute of Public Health and Hygiene in Calcutta. This institution was originally opened under a Rockefeller grant, and gives presently public health degrees to medical practitioners.

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During the First Five Year Plan, a few of the Medical Colleges and Hospitals had Dental Clinics where free Dental treatments was given to patients. In the Second Five Year Plan, the Dental Council of India induced the Government of India to make available funds for the opening of 350 free Dental Clinics attached to the 350 District Hospitals in the country. About 120 such Dental Clinics have been opened so far, and this will continue in the Third Five Year Plan till the requisite number is established.

It has also been recommended that all Railway Hospitals and big industrialized areas should have free Dental Clinics. They already exist in several centres, but more are needed. It has also been recommended that a free Dental Service be established at the 41 Universities in India.

The Dental Council of India has recommended that 500 free School Dental Clinics should be established in the Third Five Year Plan to give free dental treatment to school children from the ages of 6 to 14; each Clinic will look after 3000 children per year.

A State Dental Service is operating in four States in India, namely: Punjab, Bihar, Uttar Pradesh and Rajasthan. The recommendation has been made that a State Dental Service similar to the Medical Service should be started in all the States headed by a Director of Dental Services.

Priority has been given to the opening of free School Dental Clinics in the Third Five Year Plan. Free Dental Clinics started in the existing 2000 Primary Health Centres and 544 Maternity and Child Welfare Centres as a next step. In rural areas, Mobile Dental Trailers with Dentists and Dental Hygienists will go to distant villages to give free dental treatment. The establishment of all these steps will depend upon the funds available for Health Schemes in the Third Five Year Plan. It is not expected that all these plans for clinics will mature, but a beginning can be made and the Dentists qualifying every year in increased numbers can thus be absorbed in the State Dental Services.

We have already established a Course for the training of Dental Mechanics in the country, and the Dental Council of India has strongly recommended to the Government of India to establish training facilities for Dental Hygienists in the Third Five Year Plan. Two of the State Governments have promised to do so.

A comprehensive Note on the *"Survey and Long Term Plan for the growth of Dentistry at all levels"* for the next 20 years has been prepared jointly by the Dental Council of India and the All India Dental Association and submitted to the Government this year. The final decisions on it will be made shortly.

A Dental Health Advisory Committee exists under the Indian Council of Medical Research since 1956; sufficient funds will be available to carry out dental research in the Third Five Year Plan. Emphasis has been on two permanent Research Units to carry out research on Periodontal Diseases and Dental Caries. A W.H.O. Seminar on Periodontal Diseases was held in 1957 and the incidence of Periodontal Diseases was found to be very high in the country. Findings have been published by *Greene* and *Ramfjord*. Dental Caries in the urban areas is increasing. Due to the high contents of natural Sodium Fluoride in the soil plus the presence of Sodium Fluoride in sea-salt, tea, Tumeric powder and vegetables which constitute the staple diet of the people of India, it has so far not been found necessary to go in for Fluoridation of the water supplies in the country. The Dental Health Advisory Committee has prepared a map of India giving the distribution in parts per million of Sodium Fluoride in the country where water analysis have been carried out.

In 1945, the Bhore Committee recorded that there was one dentist to 300,000 persons in India and to-day there is a ratio of one dentist to 78,000 persons. With the increase of admissions in the existing Dental Colleges and the opening of new ones, it is hoped that this ratio will be reduced by one-half in the next 20 years.

Although we started from scratch, our progress in Dental Health Services during the last 13 years of Independence has been quite encouraging and hopeful, and we trust that it will increase in the years to come. With more funds allocated by the Government for Health Schemes we will eventually be able to take up the majority of the Dental Health Services recommended and required in the country within the next 20 years.

Dr. N. N. Bery is President of the Dental Council of India and Dental Advisor to the Government of India; he was the first Chairman of the Dental Health Advisory Committee for 3 years.

"Where is there demonstrated better than here today the important contributions being made by scientists of many nations? However, the speed and adequacy of disseminating scientific information, the methods for free exchange of ideas, the opportunity to consult scientists with specialized knowledge and experience, the ways of learning new techniques and procedures – all are of vital importance if we, as research workers, are to gain greater insight into the illusive etiology of such disorders as dental caries and periodontal disease. Major breakthroughs in research have come from many nations. They come from those rare individuals with originality of thought, observation, and reasoning who may reside anywhere. This talent is the exclusive possession of no one nation or group of people.

Even as illustrated so many times in the course of the past three days, the worldwide distribution of disease, related to natural and man-made environmental conditions, reveal variations which could provide significant insight into the causation and dissemination of dental caries, periodontal disease, and other oral diseases. Such variations and contrasts, studied systematically, may well provide the key clues to the control and eradication of oral diseases. Most certainly, basic knowledge relating to the pathogenesis of caries and periodontal disease, their origin, modification, and distribution, will be achieved only through long-range integrated studies by laboratory and clinical investigators working cooperatively with epidemiologists in countries where climate, diet, and cultural patterns differ from our own and your own." *Conference on Oral Biology by Seymour J. Kreshover, National Institute of Dental Research, Bethesda, Maryland. Reprinted from J.D. Research, Nov.-Dec. 1960, Vol. 39, No. 6, page 1095.*

We have been wondering....

IN WHAT RESPECT CAN WE IN THE UNITED STATES LEARN FROM DENTAL PUBLIC HEALTH EFFORTS IN OTHER COUNTRIES?

....And the experts answer:

John W. Knutson

If we are to be successful in our efforts to extend dental health services to an ever increasing number of people, we will want nothing less than the whole world as our stage for exchanging ideas and experiences.

We will want to observe, study, and analyze: the dental service system for school children in Norway, the removable appliance orthodontic program in Holland, the toothbrushing technique of applying fluorides topically to the teeth in Sweden, the rural health centers in the Philippines, the school dental nurse system in New Zealand, the water fluoridation program in Brazil without benefit of antifluoridationists, the national health insurance system in England, and the dental recording methods in Canada.

We will want to increase our application of intelligence to the problems of man in relationship to his environment by seizing unique opportunities for epidemiological and clinical investigations: periodontal diseases in India, fulminating osteomyelitis in Hong Kong, cheilosis in Burma, and oral sepsis following the ministrations of indigenous practitioners in Egypt.

We will want to be enlightened by each country's evidences of our fellowman's imagination in applying statesmanship to public health problems in his efforts to recognize and anticipate emerging trends molded by widely differing social, economic, and political forces, and in his attempts to adapt the content of programs to varying administrative structures and processes.

We will want to be enriched by an international openness of mind engendered by studies in sharp contrasts available in all nations: new concepts, sound and fantastic; new experiences, good and bad; new challenges, encountered and neglected and new successes, real and fanciful.

In summary, my answer to the Editor's question is: *"In every respect imaginable."*

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Carl L. Sebelius

I think that we can always obtain deas from other people, even though their programs may be quite a bit different from ours. Since it is impossible to mention a large group of program areas which we might learn from, I should like to name a few which I found of special interest.

It would seem that the organization of dental public health programs in the provinces of Canada could provide many readily usable ideas to us. The public's acceptance of routine dental services for children in Norway and Sweden is above that in this country. It would be of interest to know more of why this is true and why the professional staffs are so dedicated to the services they render.

In the Scandinavian countries, in Great Britain and the Netherlands, orthodontics has been included to a greater extent as part of public dental service than in this country; and in most of these countries, the team approach for the care of the cleft palate child has been in operation for a number of years. In Oslo, Norway, we could learn much in regard to the construction of dental clinics in the most economical way. In Switzerland, the use of fluoride tablets dispensed at the school, as well as the consumption of salt with fluoride and fluoride added to milk, should be of special interest to us. Also, in the area of preventive dentistry the mass treatment of children in Stockholm, Sweden by using fluoride solution and supervised brushing should be of interest.

In countries such as Norway, Sweden and New Zealand we should be able to find out something on how we might in this country establish a higher priority status for dentistry in health departments. From many of the less developed countries of the world, we could learn much in regard to *attempting to do a lot with little.*

Obed H. Moen

The method whereby the Dental Public Health programs parallel the Medical Public Health programs in the World Health Organization is worthy of recognition.

Through the Federation Dentaire Internationale, dentistry is enabled to work with and through W.H.O. to the extent that Dental Public Health programs now eminate from each of the eight W.H.O. Regional areas to reach all parts of the world. Medicine and dentistry in that way do form the Health Team.

The Federation Dentaire Internationale provides the entree for such service by dentistry.

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Dental Planning In Sierra Leone

W. Ayodele Samuels
B.Sc., D.D.S., F.A.S.C.D., D.D.P.H., W.H.O. Fellow

Introduction

Dental Public Health cannot be treated apart from the complexities of beliefs and customs; at every point it requires adjustment from what is known and practised in advanced societies, in its cultural, educational and practical applications. Success in Dental Public Health will mostly depend on modification of knowledge, of the community in its fullest sense. Folk medicine, economics, family structure, politics, religion and its systems of values and prestige are integral parts of the society. Human contacts should not develop from the studies of anthropologists, sociologists or social psychologists, but from personal contacts and understanding and a gradual and methodical introduction of new knowledge and practices to offset the old. Racial studies and an understanding and appreciation of customs and beliefs are never thorough at the onset, since the patterns in different societies are both intricate and varied. With the correct objectives in mind, and a proper interpretation of the society to which one is committed, scientific knowledge in Public Health could be of the greatest advantage to the people. A systematic approach to Dental Public Health problems through health education and community development with local participation of voluntary and trained workers will enhance the progress of dental health practices. A study of how greatly the application of scientific knowledge can affect the daily life of the people is a basic prerequisite.

The main hindrance to the acceptance of Western techniques and ideas is not that they are in themselves unacceptable, but that they are clothed in Western culture. For example, the use of audio-visual aids can be most effective if they are presented in local scenes and translated to meet local requirements – changing the Western attire for a simple country homespun. Cleaning the teeth with a twig cannot be drastically condemned and replaced by the toothbrush, but the more effective use of the toothbrush can be demonstrated to show its effectiveness over the twig. Or, for that matter, the twig could be used in such a way as to simulate the toothbrush until the countrys economy is favourable to the use of toothbrush and paste. Good results will not reward conviction; people need a lot of proof. Misunderstanding as to the object of any measure can produce unfortunate results. The recognition of values and prestige can be valuable. Important individuals in the community can be encouraged to use their prestige by playing a useful role in health teaching and practice. Popular acceptance of a dental health program is in direct proportion to the degree in which local representatives have taken part in the planning and conduct of it. Local channels of communication must be studied. Converts, such as the womenfolk, the teachers, the priest or headman, can push forward new methods in tune with existing beliefs. The changing of harmful habits will depend upon the gradual growth of understanding about science and its methods which a general system of education should help to bring about. Lack of a common background and knowledge, which is the great obstacle, will slowly disappear.

Present Conditions and Trends

"The African has always been thought of as having good teeth." It is true that white or near white objects show off better on a dark background, but the outstanding color must be separately evaluated and is not necessarily an equation of its structural strength. Fortunately, nearly almost all African children are breast fed, which ensures a minimum intake of calcium during the formative years of the dentition.[1] This, coupled with the fact that, for at least ten months of the year, the child is exposed, unclothed, to the direct rays of the sun, thereby receiving the advantage of nature's Vitamin D, results in the child having well-formed and calcified anteriors and perhaps first molars. But, beginning with school age, when he is clothed and protected from the sun's rays, and when he does not have regular meals, and when candies, sandwiches and cookies substitute for a regular home cooked meal, structural defects are laid down and decay is inevitable. Because of the higher cost of living and the economic status of the middle and low income groups, foods eaten are mostly carbohydrates, with sub-minimum or no protein, and are woefully lacking in minerals and vitamins. By and large, the factors influencing increasing dental diseases would be summarized as follows:

1. Malnutrition.
2. Accumulative effect of long neglect.
3. Absence of children's clinics and instructive maternal and child health centres.
4. Effects of communicable and systemic diseases.
5. The impact of Western culture on the people's food habits and an increased consumption of refined carbohydrates, especially by school and preschool children.
6. Increase in population and a steady decline of agricultural products and food supply.

In 1956-58, I conducted a random survey of school children aged 3 to 20 years in 28 urban and rural schools. I found that, of the population of 5000 children examined, 67% of the children needed immediate dental care for caries with a DMF index of an average range of 5 cavities, and that 81% of the population had dental and oral diseases and disorders of some kind, i.e. periodontitis, gingivitis, glossitis, chilosis, malocclusion, open bite, etc. The alarming proportions of dental diseases were readily evident by the above survey, but the magnitude of the problem in my country is complicated by the dentist-population ratio. In Sierra Leone, with a population of 3,000,000 people, we have a staff of five dentists and one trained laboratory technician to cope with an increasing dental health problem. There are three dental clinics in the whole country and no private practitioners. Because of this dire shortage of manpower, only emergency treatments – primarily extractions – are done for a daily attendance of 40 to 80 patients. A few fillings are done in afternoon clinics, and prosthesis is also done for those who can afford it. Thus a dental service which consists mostly of extracting aching teeth cannot be called a health service and still less considered to be a satisfactory dental service.

Since there are no trained dental hygienists or attendants, the dentist has to spend most of his time teaching and supervising the locally recruited attendants, who are not of academic quality that one would like, and who eventually resign to get married, or quit if they can get a better paying job. So there is a continual process of training and loss. With one laboratory technician, the dentists have to do most of the lab work themselves, using valuable professional manpower hours and working 10 to 14 hours a day and, not unusually, seven days a week

Program Planning

A long-range and comprehensive dental health program would include the following areas in which there is at present need for action:

1. Statistical surveys to measure the extent of dental diseases and disorders.

2. Dental health education in schools, parent-teacher organizations, group organizations, and among teachers at all levels and the public in general.

3. A dental health program that includes:

Preventive dentistry

–Preventive measures such as the topical application of fluorides or fluoridation of water supply, proper dietary habits and reduction of the intake of refined carbohydrates, if started sufficiently early, present the simplest and most economical means of maintaining the health of the mouth throughout life.

Children's dentistry

–No attention has been paid to the problem of dental service for children. Dental diseases are prevalent in the mouths of children of school age. This constitutes a serious menace to the health of the child and may lay the foundation for various other ailments in later life. It is important to plan and begin systematic dental care as early as two years old and continue preventive and conservative measures throughout school life. The elimination of dental diseases by prevention and early correction will prevent much loss of time and retardation of school children, and will unquestionably result in economic gain and improvement of the general health of the child.

Restorative dentistry

–In considering restorative dentistry the school age population must be divided into three groups:

1. Children with primary and mixed dentition.

2. Those children who are fortunate enough to have retained all or almost all of their permanent teeth in such a condition that preventive and conservative dentistry can be satisfactorily applied.

3. Those whose teeth have been so badly damaged by caries and poor oral hygiene, that only radical treatment and prosthesis can help them.

–It is extremely important that such differentiation be established, since the cost of caring for each of the three classes varies widely and requires entirely different financial planning.

Prenatal and nutritional clinics.

Research into the problem of dentistry and its relation to the growth and development of the child as a whole.

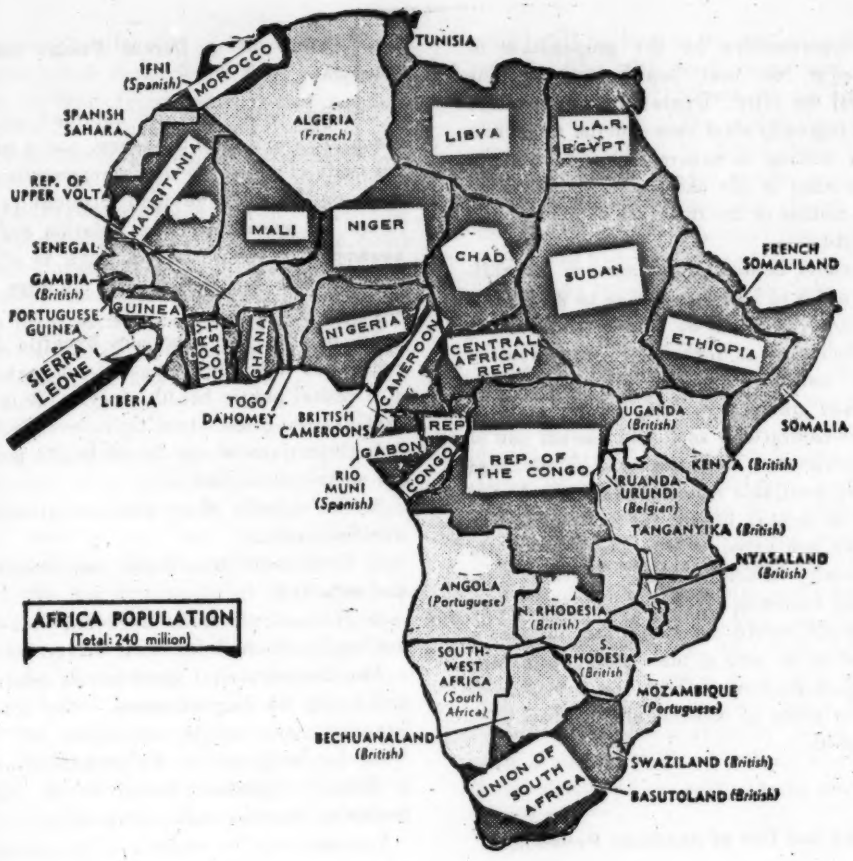
Personnel training at all levels of specialization.

Proposed Program of Dental Public Health in Underdeveloped Countries

The broad concept of a health service is that it should be available to the needy, be preventive in character, and aim to produce in a community or nation a state of complete mental, physical and social well-being. It follows that dental health must be included in any definition of health, and that the broad principles of health services must be applied to this field. Thus the World Health Organization recommends that dental health should be given a proportionate share of attention when a country is planning a comprehensive health program.

Method of Approach

A pilot program may well be the foundation upon which long-range constructive programs can be built. The initiative of such a program may prove to be the solution for improvement and development of better health standards.



Media and Methods of Health Education

In a country such as mine, where only about 26% of the population can read or write English, the use of audio-visual aids, based on local scenes and settings, and pertinent text translated into the various dialects of the areas for which they are intended, would be invaluable in the propagation of health education.

In schools, text books or other printed matter could be used by teachers for lower grades and students in high school. Posters, still pictures, motion pictures, demonstrations, and even dramatization or role-playing would stir up the incentive of pupils.

Preschool and School Children in a Dental Public Health Program

The establishment of clinics for expectant and nursing mothers to provide instruction in diet, nutrition, home care of children's teeth and oral hygiene, would offer one of the

best opportunities for the propagation of knowledge on oral health and hygiene amongst the laity. Dental health education would logically start here with the expectant mother willing to ensure that her baby got a good start in life and would be continued by the mother in the interests of herself and her child.

A school dental health service for children aged 3 to 18 years of age is important. This service must be educational, using such methods as lectures in conservative dental health measures, discussions in older age groups, projects, slides, movies, and demonstrations as to the correct use of the toothbrush. Teachers must be educated in using available materials to interpret the value of dental health to the pupils and must be motivated to use these materials beneficially in health talks. The organization and fostering of *"Good Health Clubs"* in schools would stimulate the children's interest in the care of their teeth, the avoidance of undesirable habits, the selection of fruits in place of sweets, and in their general health.

Training and Use of Auxiliary Personnel

In a country where there is a high rate of dental caries in particular, and dental diseases and disorders in general, and where the proportion of manpower to population is woefully inadequate, the training and use of auxiliary personnel would be the only solution to the enormity of the problem. These auxiliary personnel could be trained in a central station to take case histories and X-rays, to make general oral examinations, to chart conditions of the teeth, to give prophylaxis and instructions in home care and to do simple fillings in deciduous teeth. This program would be carried out and integrated with the educational program under the supervision of qualified persons.

The Future of a Dental Public Health Program

Uniform data must be obtained on the prevalence of dental diseases, and a measure made of the scope of the program through the use of well devised clinical record forms. A systematic accumulation and assessment of facts and opinions is a prerequisite for the purpose of planning and making decisions.

To realize the maximum benefits from evaluation in the development and operation of a dental public health program, it is essential during the planning to ensure that:

1. Objectives of the dental health program are clearly specified;
2. The criteria of success or failure are decided upon;
3. Evaluation procedures are developed and selected;
4. The methods to be used are well chosen and pretested for their effectiveness.

The importance of good human relations can hardly be overestimated – the acceptance of other people, no matter who and what they are; respect for personality; and a friendly approach based on an innate desire to like and work with people.

Caution must be exercised in attempting to transfer experiences and methods from one environment to another, and from one type of society to another. Full understanding of the community is a requisite for an effective health program. Failure to take into account such intangibles as customs and beliefs may well be the rock upon which efforts to improve health standards will flounder. It will be highly desirable to discover and to take into consideration the needs felt by the people who are intended to benefit and to understand their attitudes.

Summary and Conclusions

The need for public health service in underdeveloped areas was recognized by the

International Dental Federation and brought to the notice of the World Health Organization in their report which expressed, *"a sincere desire and an equal degree of concern for the well-being of all kinds of peoples in the world, irrespective of color, racial origin, education, social or economic status, or political party."* In Africa, South of the Sahara, there have been no reliable data as to the prevalence of dental diseases and little evidence of a dental health program, nor active concern for the prevention of dental and oral diseases.

It is my belief, from a knowledge of existing conditions in my country, that health education is as important as teaching the people to read and write. People need to learn what to eat, from locally available foods, to give them the optimum basic food nutrients; the importance of drinking clean water, disposal of wastes, personal hygiene, the care of the infant and child, as well as the care of the mouth. But who will teach them? I shall be responsible for organizing a dental health program throughout my country. Nothing exists. How and where will I start? Without trained assistance and with an acute shortage of manpower, on whom will I call for help in co-ordinating the program? Who will teach those who are to teach the people? There are no dental or medical schools. The prohibitive cost of training personnel in Great Britain or in America and the limited number that can be accepted in these countries clearly shows that the hope of improvement lies in the recruiting of high school graduates and locally training them there, as is done in New Zealand and now in Britain. I am not pessimistic of the future success of such a program. I am hopeful that I shall successfully enlist the co-operation of my government, of my colleagues, both medical and dental, as well as those in allied professions, of politicians, statesmen, and, gradually the general public as a whole, and demonstrate the value of putting into operation modern scientific knowledge, for the benefit of the child, family and community in a rapidly changing country. Health in itself is *Independence*, therefore the independence of a country, if it is to survive and flourish, must be built by a healthy nation. *"Initium est difficile"* – the beginning is always difficult – but *"Every step forward reduces the miles in the journey of Progress."*

REFERENCES

1. Shaw, J.H. – Studies on the Effect of Moderate Calcium and Phosphorus Deficiencies During Pregnancy and Lactation on the Caries Susceptibility of the Offspring (unpublished 1954).

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Dental Public Health In The Republic Of INDONESIA

R. G. Soeria Soemantri,
D.D.S., M.P.H., F.A.C.D., M.R.S.H.

INTRODUCTION

It has aptly been said that the public health problem in the underdeveloped countries is not just a medical problem, but a socio-economic and educational problem as well. It appears that there is a close relationship between poverty, education, and health, a vicious cycle from which it is difficult to escape.

Dental public health is only a small part of the total health picture. In order to have a clear understanding of the dental health problems, it is essential to have first an insight into the general health problems of the country. With this conviction in mind an attempt will be made here to give the reader background information concerning some characteristics, data, and health status which prevail in the Republic of Indonesia.

General Description of the Country

On August 17, 1945 the people of Indonesia proclaimed their independence which was followed by four bloody and bitter years of revolution against the former Colonial Government. It was not until December 1949 that the two combatants agreed to come to terms of peace, and the transfer of sovereignty took place. Since then the National Indonesian Government started rehabilitation and reconstruction in all fields, trying hard to keep pace with the rapid progress in this atomic century.

Geography

The Republic of Indonesia consists of a group of islands situated between Australia, the Philippines, the Asian Continent, and the Indian Ocean. It comprises the larger islands of Sumatra, Java, Celebes, Borneo (except for the Northern part which is British), and West New Guinea. The smaller islands are Bali, Lombok, Timor, the Moluccas and some 3000 others. The total land area of the Republic of Indonesia is about 815, 865 sq. miles. The islands are mostly mountainous and volcanic with low-lying plains in the coastal regions. The volcanoes number 540 inactive and 167 active, with the highest mountain 12,467 feet high.

There are a large number of short turbulent rivers, not many of which are navigable. The climate is tropical except in the higher altitudes, with a dry and a rainy season. In general, the mean temperature is 78° F. Rainfall during the rainy season which is from November to April is abundant and varies from 100 to 250 inches per year. The relative humidity ranges from 73% to 88%, and the median is 80%.

Population

The first census since 1930 will be held in October this year. The most recent estimate gives the population of Indonesia as 95 millions, and the population increase as 2.2 per cent per year. Java, the main island and the seat of the Central Government, has a population of approximately 60 millions, and is considered as one of the most densely populated areas of the world. In contrast with this, the other islands are very thinly populated, ranging from 50 to 15 persons per sq. mile. There are some large cities such as the capital Jacarta (about 3 million people), Bandung (1 million), Sourabaya, Medan, Makasar, etc. Approximately 90 per cent of the population live in rural areas. This rural population forms the greater part of the Indonesian community, and life is strongly influenced not only by socio-economic, religious, and cultural factors,

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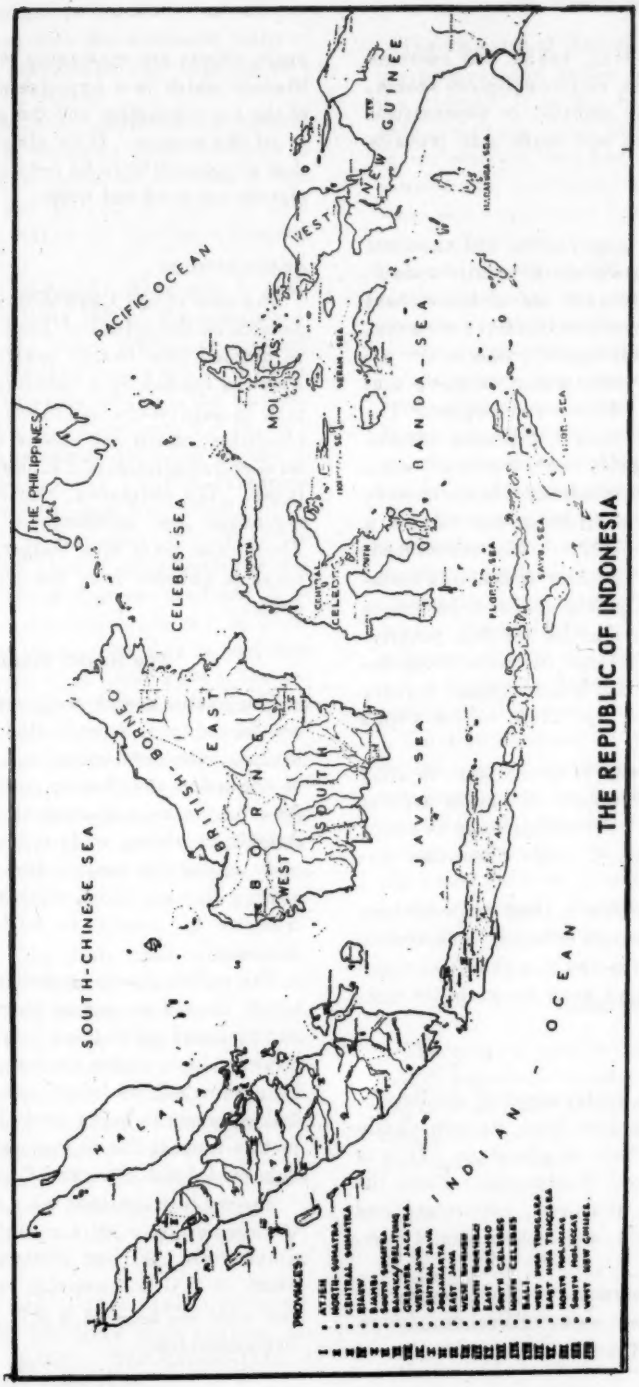
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WEST NEW GUINEE

but also by tradition, habits and customs which belong to the magico-religious sphere. The belief in the magical or supernatural causes of disease and death still prevails in the rural areas.

Economy

The rich soil, large forests and abundant minerals of Indonesia are generally considered to make Indonesia one of the richest countries in the world in natural resources. The most important export products are petroleum, rubber, tin, sugar, coffee, tea, palm-oil, copra, tobacco and pepper. The Indonesian soil conceals still more mineral wealth such as gold, coal, iron-ore, etc., which waits for development. In contrast to its potential wealth, Indonesia carries a heavy burden of poverty. The unbalanced, colonial type of economy which was maintained during the pre-independent period, is one of the basic reasons for this poverty. The most recent official estimate of the national income is Rp. 204,5 milliard a year, or an average of Rp. 2153. – per capita per annum.[1]

Since the transfer of sovereignty in 1949 the National Government is making serious efforts to change the colonial-type economy into a well balanced, more diversified national economy.

Beginning this year a large scale nationwide building program is being implemented, and it is to be expected that this first eight-year plan will give some boost in the economic field.

Education

An outstanding achievement of the Republic of Indonesia has been its remarkable progress in the field of education. This is true for every level of education: basic literacy education programs, elementary and secondary schools, and institutions of higher learning.

In 1949 it was estimated that 85 per cent of the population were illiterate. Large scale efforts are continuing to stamp out illiteracy which is a formidable task in view of the big population and the general poverty of the people. It is claimed, however, that at present 50 to 65 per cent of the population can read and write.

1 – The official rate is $1. to 45 Rupia.

Administration

The seat of the Central Government is in Jacarta on the island of Java. The country is divided into twenty provinces, each of which is headed by a Governor. Each province is subdivided into regencies and municipalities, which are subdivided again into smaller jurisdictions, i.e. districts and villages. The provinces, municipalities, and regencies are autonomous in character. They have their own budget, but also receive a subsidy from the Central Government.

The Health Status

The public health problems in Indonesia are tremendous, complicated by great distances, poor communications, low standards of education and poverty of the population. As it is the case in most of the South-East Asiatic countries, so in Indonesia epidemic and chronic-endemic diseases prevail, making thousands of victims and causing millions of people to suffer from these diseases.

The public enemy number one is *malaria*, which causes an annual mortality of 20-40 per thousand population. It is to be expected however, that within ten years malaria will be eradicated, as large scale malaria control programs is being carried out at present. In this respect the Government is receiving substantial aid from the I.C.A.

Second in magnitude as a health problem is *tuberculosis* with a mortality rate of approximately 200 per 1000,000 population a year. A B.C.G., campaign is being carried out with the help of W.H.O., especially for schoolchildren.

Ankylostomiasis is considered a very important disease from the economic point of view, with a prevalence rate between 80% and 90% in rural areas.

Trachoma is very prevalent in coastal areas. A pilot trachoma control project is being implemented with the assistance from the W.H.O., and Unicef, in order to gain data and experience to develop a program of mass control.

Yaws is widespread. According to estimates yaws affects 15% of the total population; 6% of the cases are infectious, and 75% of the infectious cases are in children of less than 18 years of age. The Government, assisted by Unicef and W.H.O., initiated a mass campaign for yaws control in 1950 which is known as T.C.P.S. (Treponematoses Control Program Simplified).

Leprosy. It is extremely difficult to obtain an accurate idea of the prevalence rate for leprosy. From figures available it is estimated that the prevalence rate is 1 per 1,000 of population. But this is undoubtedly too low and it is believed that the endemicity of leprosy in Indonesia is much higher.

Other communicable diseases such as *typhoid fever, bacillary* and *amebic dysentery, diarrhea,* and *pneumonia* are widespread thoughout the country. *Cholera* is not endemic. *Small pox* and *plague,* once the scourges of the population, are now under control.

Nutrition. The daily food of the Indonesian peoples contains less than the normal calories and protein required. It has been recognized for a long time that the high infant and child mortality rate is largely due to malnutrition. Among the nutritional diseases beriberi, aviaminosis A, and endemic goitre are prevalent.

Mortality rates. The following are ranges of estimates of the mortality rates:

Crude death rate – 10 to 15 per 1,000
Infant mortality rate – 115 to 300 per 1,000 live births
Matemal death rate – 12 to 15 per 1,000 births

The ratio of available beds and population is 8 to 10,000. The expectation of life is less than forty years.

The Health Service

The Ministry of Health is responsible for the medical and public health services of the nation. It is the supervising and coordinating body which determines the policy of the medical and health services. The autonomous, provincial government supervises and coordinates health programs within its jurisdiction.

There are two types of local health organizations, viz., the regency and the municipality health departments. The former is predominantly rural, while the latter is more or less urban. However, a sharp distinction between rural and urban cannot be drawn. These two types of local health departments are the executive authorities for carrying out the health programs and financing them from their own resources, some times with a grant from the Central Government through the provincial health departments. The medical staffs of the regency and municipality health departments exercise supervision and control over the district health units which personnel consists exclusively of para-medical people.

Curative treatment is the backbone of the health service, as most of the people are too poor to pay for the fees of the private practitioners. In fact, most of the health budget has been used for curative care of the population by establishing a chain of health centers (hospitals and clinics) throughout the country.

Manpower

There is a terrible shortage of trained health personnel in Indonesia. The following data will give a clear impression of the man power problem which the Ministry of Health has to face:

	Total	Approx.ratio per population
Physicians	– 1850	– 1 : 50,000
Dentists	– 400	– 1 : 240,000
Pharmacists	– 150	– 1 : 600,000
Ass. Pharmacists	– 1000	– 1 : 95,000
Midwives	– 2000	– 1 : 45,000
Nurses and ass. Nurses	– 7000	– 1 : 13,000

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In order to meet this manpower shortage, the Government is establishing new medical and dental schools, and expanding training facilities for auxiliary health personnel. At present there are seven medical schools and four dental schools, while 2 other state dental schools are being prepared to be opened in September of this year.

Dental Public Health

From the preceding it is obvious that at present dental public health does not have a high priority in Indonesia, as the Government has to face tremendous health problems which are manyfold and complex.

There is, however, a Division of Dental Hygiene in the Ministry of Health which is on the same level as the other divisions, such as Divisions for T.B. control, malaria control, Hospital Services, etc. It has administrative autonomy and freedom from medical dominance which is a very important fact, as in most of the Asian countries dental health does not reach the ministry level, but is subordinated to one of the medical divisions.

The Division of Dental Hygiene has the following tasks:

a. Development of dental health programs

b. Provision of dental professional personnel

c. Provision of dental equipment and materials

d. Training of dental auxiliary personnel

e. Coordination and administrative supervision of local dental programs

f. Research in the field of public health dentistry.

Provincial level. There is a Chief Dental Officer in each province, who is a member of the staff of the Provincial Health Department. The Chief Dental Officer plays an intermediary role between the Ministry and the local health departments, with the emphasis on the coordination and evaluation of the local dental programs within the province.

Local level. The Regency or City Dental Officer has the following task:

a. Administration of the local dental program and provisions of funds to finance it

b. Employment of the necessary professional personnel

c. Integration of the dental health activities with the general health program

d. Maintenance of adequate records and provision of reports.

(See Organization Chart)

Program Plan and Program Administration

When the Division of Dental Hygiene was established in 1950, it got the task of designing a national dental health program which should be effective, practical, and economically feasible. It was a difficult task indeed, owing to the following facts:

a. The small number of dentists available for the whole country.

b. There were only 2 dental schools of which one had been established only one year before.

c. Lack of facilities and equipments.

d. Not a single expert in dental public health was available.

e. The economic situation of the country was bad.

Considering the above mentioned facts, it was to be understood that no comprehensive dental program could be drafted but an emergency one.

The following guiding principles have been adopted:

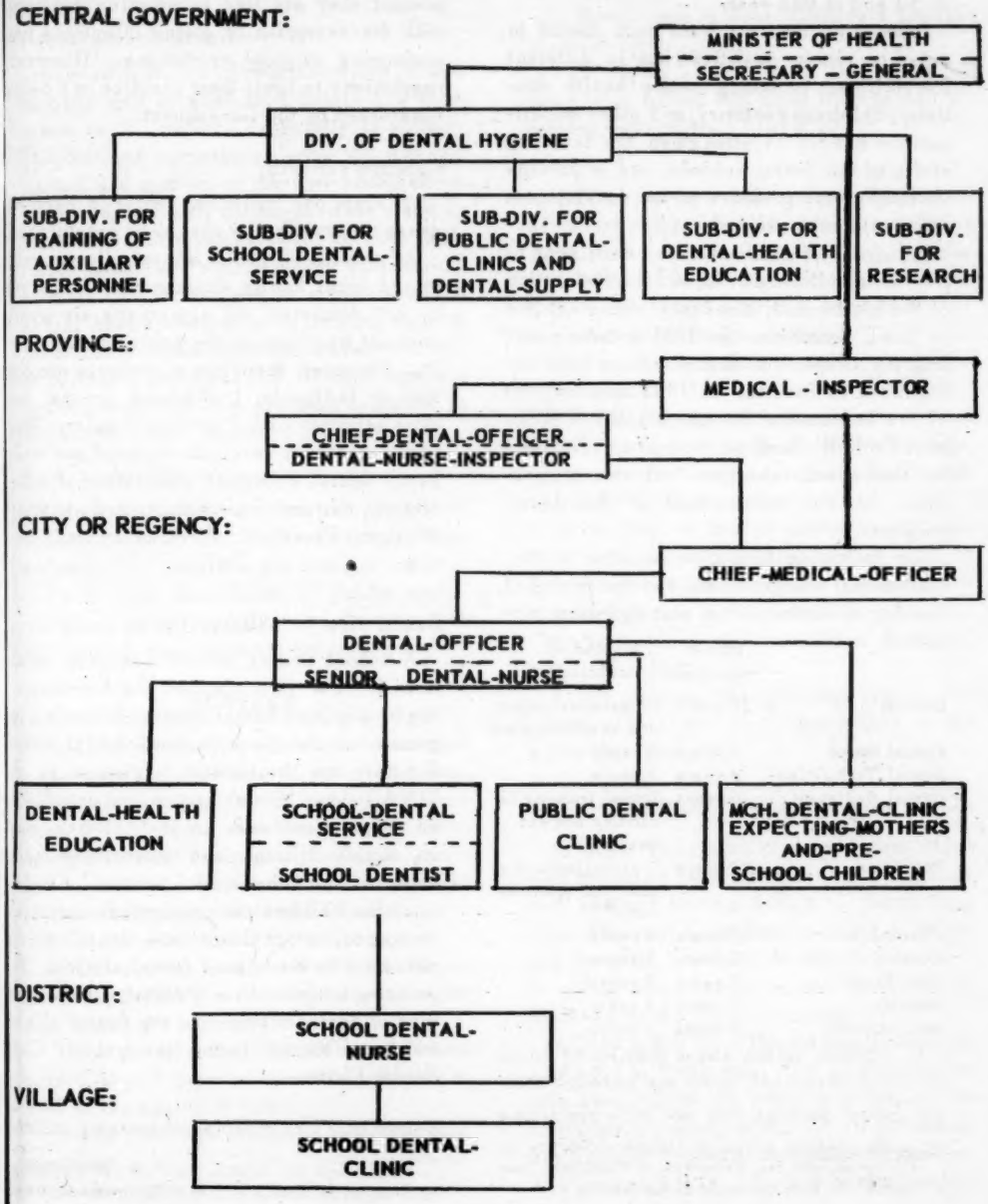
Dental man power

The dental man power should be increased in order to be able to cope with the dental needs of the population.

Attempts have been made to increase the annual output of the two existing dental schools and to promote the establishment

ORGANIZATION CHART

Division of Dental Hygiene, Ministry of Health



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of new dental schools. As mentioned earlier two additional dental faculties were founded in 1959, while two other schools are being set up, making a total of six dental schools at the end of this year.

Indonesian dentists were sent abroad in order to obtain qualifications in different specialties, including public health dentistry, childrens dentistry, and other qualifications needed to strengthen the teaching staffs of the dental schools, and to provide leadership and guidance in the development of dental health programs.

Indonesian dental missions were sent to New Zealand, Singapore, and the Federation of Malaya to study the dental nurse scheme in those countries. In 1951 a three-year training course for dental nurses was established in Jacarta. In 1953 upon request of the Indonesian Government, the W.H.O. sent Prof. R. Bradlaw as a short term dental consultant, who gave valuable suggestions for the improvement of the dental programs.

The following data give an idea of the educational qualifications and the period of training of dental and of some medical personnel:

	Basic education	Period of training
Dentist	12 years	5 years(including one year predental)
Dental Nurse	9 years	3 years
Dental Technician	9 years	3 years
Dental Assistant	6 years	formal training facilities not yet available
Physician	12 years	7 years(including one year premedical) [1]
Pharmacist	12 years	4 years
Nurse	9 years	3 years
Ass. Nurse	6 years	2 years
Midwife	9 years	3 years
Ass. Midwife	6 years	2 years

In addition to the above mentioned types of dental personnel, there are persons without formal training who are still practicing dentistry in larger and smaller cities. These unqualified practitioners are called "Tukang Gigi," all of them of Chinese origin and numbering about 2000 to 3000. Up to the present they are free to practice dentistry with the exception of giving injections and performing surgical operations. However, regulations to limit their practice are being considered by the Government.

1 — The medical school in Jacarta which has an affiliation with the University of California, has reduced the training period to six years.

Curative services

At least one treatment center in each regency or municipality should be established.

At present 90 public dental clinics exist in the local health departments, being run by 180 dentists. All age-groups are available for treatment in the public dental clinics. However, the types of patients are limited to indigents, low-income groups, and civil servants with a low basic salary. Most of the treatment services rendered are emergency dental treatment, consisting of relief of pain, extractions, amalgam and synthetic fillings. Prosthetic services are only provided in some big clinics.

Dental care for children 3 to 14 years

A School Dental Service has been established. For this purpose the Government employs school dental nurses, following the pattern of the New Zealand dental nurse. Contrary to the dental hygienist in the U.S.A., these dental nurses are entitled to do simple treatments for the children, such as simple fillings and extractions under supervision of the school dentist. Furthermore the children receive annual dental examination, prophylaxis and dental health education in the school dental clinics. The preschoolchildren (3 – 6 years) get the same type of dental services in the dental clinics which are located in the Maternal and Child Health Centers.

Dental care for expectant and nursing mothers

Facilities for dental care of the expectant and nursing mothers have been made avail-

able in the Maternal and Child Health Centers which are integrated with the M.C.H. program.

Dental health education

Education in the correct principles of oral hygiene and in good food habits has been given to the public, especially to schoolchildren and to mothers during the prenatal period, and mothers of the very young child. In accordance with the suggestions made by the W.H.O., that money might be more profitably spent on "educating the educators," efforts have been made to concentrate the dental health education in training centers for health personnel (nurses, midwives), and in teacher's colleges. P.T.A.'s and women's welfare organizations are also included in the dental health education program.

Other preventive services

Other preventive services with the aim of reducing dental diseases should be considered.

Up to now fluoridation of public watersupplies, topical application of fluorine, dietary control, etc., have not yet been done.

SURVEYS

In 1954 an attempt was made to conduct a survey on the DMF rate of school children.

Dental examinations of school children aged 6 – 16 years were made in 15 cities, using mirror and explorer according to standard instructions laid down by the Division of Dental Hygiene, Ministry of Health.

This survey revealed the following:

a. On a total number of 20,285 school children, the DMF rates show a great variation among the various cities.

On the average, the DMF rate starts with 0.54 at 6 years of age and increases to 3.80 at the age of 16 years.

The DMF rate for girls is higher than for boys.

b. About 84% of all children require some treatment for both decidous and permanent teeth. More than 60% need treatment on their permanent teeth only.

c. Dental care is most inadequate amongst these children.

Of all the affected teeth only about 1.4% have been filled, 90% need fillings and 9% require extractions. *(Table 1)*

Another survey on the caries experiences of school children 6 – 13 years is now being conducted in the Bandung area in collaboration with an expert in statistics from the W.H.O. The purpose of this survey is:

a. An epidemiological study.

b. For the evaluation of the existing dental programs.

In this study the caries experience rate will be measured as associated with age, sex, race, oral hygiene habits, and socioeconomic status.

A seminar on dental public health was held in January 1959. Government dentists from the provinces throughout Indonesia participated in this seminar which has in view:

a. To improve the knowledge in dental public health.

b. To discuss the existing dental programs and to find ways and means to improve the same.

Aid From Foreign Agencies

In accordance with the resolution which was proposed by the Indonesian Delegation and adopted by the W.H.O. – South East Asia Regional Committee meeting in Bangkok in 1953, the World Health Organization is giving due attention to the dental health problems in the Asian countries.

In 1954 a W.H.O. – Dental Health Seminar was held in Wellington, New Zealand which was attended by the representatives of the countries belonging to the S.E.A. and Western Pacific Regions, including Indonesia. The Second W.H.O. – Dental Health Seminar

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TABLE 1

Dental Caries Experience, Permanent Teeth and Per Cent of Children with One or More D.M.F. Permanent Teeth, by age, for 20,285 Children, INDONESIA, 1954

	Age Last Birthday										
	6	7	8	9	10	11	12	13	14	15	16
Number of Children	1327	2485	2435	2689	2339	2201	2550	2101	1468	541	149
D.	695	2248	2877	4025	4007	4314	5897	5857	4438	1578	481
M.	24	126	161	309	417	488	642	650	641	218	78
F.	1	20	51	88	47	58	60	100	81	20	8
DMF Teeth	720	2394	3089	4422	4471	4860	6599	6607	5160	1816	567
D Teeth per person	0.52	0.90	1.18	1.49	1.71	1.96	2.31	2.79	3.02	2.91	3.23
M Teeth per person	0.02	0.05	0.07	0.12	0.18	0.22	0.25	0.31	0.44	0.40	0.52
F Teeth per person	0.0	0.008	0.02	0.03	0.02	0.03	0.02	0.04	0.05	0.04	0.05
DMF Teeth per person	0.54	0.96	1.27	1.64	1.91	2.21	2.58	3.14	3.51	3.35	3.80
Per Cent of Children with One or More DMF Teeth	25.8	41.3	51.9	62.3	65.1	67.4	71.4	78.4	79.9	82.8	85.2

was held in Adelaide, Australia in 1959. The objectives of these Seminars were to identify and discuss current dental health problems, and to review accomplishments in the two Regions.

Fellowships for the study of Public Health Dentistry, Children Dentistry, and other specialisms have been given by the W.H.O., Unicef, and I.C.A.

Health Laws

In a frantic attempt to cope with the tremendous health problems, the Government has joined funds and forces and adopted the following health laws:

a. An emergency law which compels every private physician to work full-time for the Government.

It is to be noted that all Government physicians can still have their own private practice after their office hours, as the Government offices are open from 7 A.M. to 2 P.M.

Although private dentists are not subject to this law, most of them are engaged in some activity for the Government on a part-time basis, viz., teaching, in the in the public or Army dental clinics.

b. Another law which stipulates compulsory service for a period of at least 3 years to be fulfilled by newly graduated physicians, dentists, and midwives, before they can get their license for private practice.

c. A third law gives power to the Ministry of Health to declare as closed for the location of new private practitioners those cities which have relatively enough physicians, dentists, and midwives. This law is designed to secure an equitable distribution of the members of the health profession throughout the country.

In addition, a new public health law, adjusted to the new conditions, is being drafted.

The Indonesian dentists, united in the Indonesian Dental Association are fully aware of their responsibility. They not only support the policy of the Ministry of Health, but take also leadership in meeting the dental needs of the population.

CONCLUSION

From the preceding the reader might have obtained a general idea of the health problems of the Republic of Indonesia which are so many fold, widespread, and complex.

The Indonesian people, still in the period of transition, are struggling with great difficulties, and it is evident that poverty, ignorance, and disease constitute a trinity. In addition, the population is increasing rapidly which is not followed by adequate increase in economic development. The health services are ill-equipped to meet the health needs of the large population.

Dental public health, still in its infancy, is confronted with tremendous problems different from those in the U.S.A., or in European countries, due to the difference in the stage of development and prosperity of the people. Therefore it has to be faced and solved in a different way.

Although at present organized dental treatment is the dominant activity of the dental health service, due attention has been given to prevention.

It is often asserted that the caries rate in the less developed countries is low, but surveys in Indonesia have revealed that decay rate among schoolchildren is high enough.

It is recognized that one of the principal bases of public health is the health of mother and child. In tackling dental health problems in Indonesia primary attention has been given to children, and to expectant and nursing mothers.

Dr. Soeria Soemantri is Director of Dental Health Services, West Java and Dean of the Dental Faculty.

TABLE 1

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Recent Research In Dental Public Health 1956 – 1960

Frank E. Law

D.D.S., M.P.H., F.A.P.H.A.

This report is composed of two phases. The first phase is disease oriented and covers research on the prevention and control of five oral diseases – dental caries, fluorosis, periodontal disease, malocclusion and oral cancer. The second phase is essentially program oriented.

DISEASE CONTROL

Dental Caries

Reports from long and short term water fluoridation programs[1-9] provide continuing evidence of the efficacy, safety and economy of this public health measure. The benefits of water fluoridation become evident after the second year of use and continue to accrue to those using the water. Studies of the physiologic effects of fluoride absorption[10-11] attest to the fact that no hazard to health is involved in the fluoridation of public water supplies.

In a detailed study of Maryland children after 5 years of fluoridation, Russell and White[12] concluded that caries inhibition was "a simple function of the length of fluoride exposure prior to eruption of teeth and the consequent risk of attack by dental caries." The most striking caries-inhibitory effect was shown in children whose first waterborne fluoride exposure occurred during the period of calcification.

In a study of malocclusion in children in a fluoridated area[13] the authors found decreases in the prevalence of malocclusion after 8 to 10 years of fluoridation. There was 17 to 20 percent less malocclusion than in pre-fluoride baseline groups. A non-fluoride control group showed increased prevalence of malocclusion over the same period.

Efforts have been directed toward simplifying the mechanical process of feeding fluorides. Maier and Bellack[14] have designed and are field testing a device to analyze and record automatically the fluoride concentration in water and to regulate the fluoride feeder. They point out that with this mechanism "a constant fluoride level would be maintained automatically in the treated water regardless of variations in water consumption, fluoride level in the untreated water, and purity of the fluoride compounds."

Bellack[15] has developed a simple, rapid distillation method for fluoride analysis which requires neither steam nor compressed air, does not dilute the sample and uses only standard items of apparatus. This research worker also has introduced a new reagent (SPADNS)[16] for rapid photometric determination of fluoride ion concentration. The reaction is immediate, stable, and precise and the method may be applied to most water samples without pretreatment.

The major item of cost in fluoridating public water supplies is the chemical. If this cost was reduced, water fluoridation would be even more economical than at present. A major step in fluoridation has been the development of a method with equipment to dissolve fluorspar in alum[17-18] and make this cheapest of fluoride compounds available for water fluoridation. Two plants using this method of feeding fluorides into community water supplies are currently in operation.

The Research Division, College of Engineering, New York University studied the water fluoridation practices in major cities of the United States.[19] The report on this study was presented to the New York State Department of Health. The study covered 60 percent of the population using water treated with fluorides in 1957. Conclusions resulting from this study are summarized in the report as follows, "economical and sound methods for controlled use of fluorine-bearing chemicals are clearly established in the record. Engineering has succeeded in meeting the challenge of fluorine application."

A study of Spitz, Taylor and Harris[20] of water samples collected in three cities adding fluoride to their water supplies demonstrated the need for meticulous practice in maintaining the constancy of fluoride levels. The maximum benefits in preventing dental caries will not be developed unless optimum fluoride concentration is maintained. Failure to exercise the necessary vigilance now will bring future discredit and recrimination if the promised benefits fail to materialize.

Taylor[21] has presented a simple method for a continuing evaluation of fluoride levels in a water supply system.

A report by Lewis and Leatherwood[22] on the effects of varying natural fluoride concentrations in three Georgia cities definitely confirms the preceding conclusions. Children using water with an optimum fluoride concentration (0.75 p.p.m.) averaged 1.8 DMF teeth per child; at 0.38 p.p.m. of fluoride the DMF rate was 3.0 per child; and at 0.11 p.p.m. the average was 4.6 DMF teeth per child. The optimum fluoride city has twice as many caries-free children as the second city and over 2½ times as many as the lowest fluoride community.

Maier[23] has described a practical system for fluoridating individual water supplies. This method gives promise of bringing the benefits of fluoridation to that 40 percent of our population who do not have access to community water supplies. The system has been field tested in about 25 homes over the past several years. Development of less costly equipment, methods of servicing, and organizational problems are being studied.

The Division of Dental Public Health and Resources currently is using similar equipment to fluoridate the water supplies of four elementary schools. This study is based on the assumption that the part-time use of fluoride water will produce significant benefits in the prevention of dental caries.

Support of this assumption is provided in a study by Yacavone and Lisanti[24] of the effects of part-time exposure to natural waterborne fluorides on the incidence of dental caries. This report indicates that consumption of water containing optimal amounts of fluorides for only part of a day will result in a decrease in the incidence of dental caries. The reduction in caries appears to vary proportionately with the amount of fluorides ingested, and even the small amount of fluoride consumed at school resulted in some reduction (10 percent less for all permanent teeth, 18 percent less in premolars, and 9 percent reduction in molars).

To approach more nearly a fluoride intake similar to that ingested in community water fluoridation, fluoride levels of 3 to 5 times the optimum for full-time consumption are being maintained at the schools during the school year. It will be 2 or 3 years before the potential benefits can be assessed.

Galagan and co-workers[25] investigated the relationship of climate to the fluid intake of children 10 years of age and under in two California towns. They found in the study area that under normal living conditions water intake increased directly with increases in temperature.

On the basis of the fluid intake study, a method was developed for determining opti-

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mum fluoride concentrations in water supplies.[26] This method takes into account the effect of environmental temperature on water consumption in children. Optimum fluoride levels for mean maximum temperatures form 50° through 95.5°F. are presented.

Alternatives to the fluoridation of water supplies have been proposed for the systemic administration of fluorides. The most important of these vehicles are milk, salt, and fluoride tablets (or drops).

A statement by the World Health Organization, Committee on Water Fluoridation[27] adequately describes the current status of these suggested methods. "At present, the value of milk and salt for fluoride administration cannot be compared with that of drinking water, since the evidence in favor of the first two vehicles is incomplete: in particular, there is a total lack of clinical evidence of their effectiveness. On the other hand, tablets have been shown to have some positive effect, although the experiments with tablets have been performed for a much shorter time and on a much smaller scale than drinking water fluoridation. Continued research on these fluoridation methods should be encouraged. If their effectiveness, practicability, and safety of application can be satisfactorily demonstrated, they may become very valuable in regions where water fluoridation is impossible."

A group of research workers at Louisiana State University recently (September 1960) reported[28] on the use of fluoridated milk for the prevention of dental caries in school children. Unfortunately, only an abstract of the report was available. Fluoridated milk was served daily with the school lunch to a group of children aged 6 to 10 years at the start of the experiment. After 4½ years, a 78 percent reduction in dental caries was obtained in teeth erupting after the start of the study when compared to a similar group of children served non-fluoride milk.

Where fluoridated water is not available the topical application of fluorides to the teeth of children is well established as a valuable preventive practice.

Over the past several years considerable interest has developed regarding the use of stannous fluoride for topical application. Muhler and co-workers in Indiana and Jordan and Synder in Minnesota probably have been most active in testing this fluoride compound.

A 4 year study by Gish, Muhler, and Howell[29-32] compared annual applications of 8 percent stannous fluoride with a series of four applications of 2 percent sodium fluoride once every three years. At various periods throughout the study the stannous fluoride groups are reported to show from 17 to 59 percent less dental caries than the sodium fluoride treated groups. The average over the 4-year period indicated 45 percent less caries in newly erupted teeth in the stannous fluoride groups.

McDonald and Muhler[33] compared the efficacy of 4 applications of 4 percent stannous fluoride and 4 applications of 2 percent sodium fluoride in reducing caries in primary teeth. The group treated with stannous fluoride showed a 57 per cent reduction in def tooth rate and the sodium fluoride group a 21 percent reduction when compared to untreated controls. Surface reductions were 37 and 12 percent, respectively.

Muhler[34] applied a 10 percent solution of stannous fluoride to the teeth of adults and at the end of one year found a 24 percent reduction in DMF teeth.

Jordan, Synder and Wilson[35-36] applied an 8 percent stannous fluoride solution annually to the teeth of 12 to 15 year old children. At the end of the first year there was a 20 percent reduction in carious teeth and a 14.4 percent reduction in surfaces in the experimental group. After two years there were 38 percent less carious teeth and 38 percent less carious surfaces in this group.

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Nevitt, Witter and Bowman[37] compared the results after applying 2 percent sodium fluoride and 2 percent stannous fluoride to comparable groups of 9 to 14 year old children. Sodium fluoride solution was applied on one side of the mouth and distilled water on the other half in one group and stannous fluoride was applied similarly on the second group. After one year the group treated with sodium fluoride had a 35.9 percent reduction in caries and the stannous fluoride group a 44.4 percent reduction.

Law, Jeffrey and Sheary[38] applied fluoride solutions, on a half mouth basis, to three groups of elementary school children in Delaware. One group received 4 applications of 2 percent sodium fluoride, another group 4 applications of 2 percent stannous fluoride, and the third group one application of 8 percent stannous fluoride. At the end of one year the treated teeth in each group had 35, 33, and 17 percent less caries, respectively.

In a two-year study of stannous chlorofluoride Howell and Muhler[39] found this compound 87 percent more effective than sodium fluoride one year after the initial treatment. However, at the end of two years this superiority has decreased to 33 percent.

Muhler[34] tested 4 applications of potassium fluorostannite on the teeth of school children. Ten months after the applications the DMF teeth increment was 1.21 for the control group and 0.56 for the potassium fluorostannite group. At the end of 3 years the controls had an average increment of 2.14 and the test group 1.27 DMF teeth.

The effectiveness of stannous fluoride in children residing in an optimal fluoride area was studied by Muhler.[40] Continuous residents 6 to 17 years of age received a clinical and radiographic examination, prophylaxis, and topical treatment at 6-month intervals. At the end of 12 months the study group had 35 percent less DMF teeth and 31 percent less DMF surfaces than the group receiving distilled water.

There is considerable interest, at present, in the value of dentifrices for applying fluorides or other medicaments to the teeth to inhibit dental caries.

Muhler and co-workers[41-42] reported a two-year study of unsupervised toothbrushing by adults using a stannous fluoride dentifrice found 54 percent fewer DMF teeth and 42 percent less carious surfaces at the end of one year. After two years use, only 30 percent less carious teeth and 34 percent fewer carious surfaces were apparent.

Jordan and Peterson[43-44] tested the effectiveness, over a two-year period, of a dentifrice containing stannous fluoride in children with supervised brushing once a day after lunch in school. After one year of use a 35 percent reduction in carious teeth and a 34 percent reduction in carious surfaces is reported. Results at the end of two years use showed 16 percent less DMF teeth and 21 percent less DMF surfaces. A third group using the dentifrice for two years without supervised brushing had 16 percent fewer decayed teeth and a 12 percent reduction in carious surfaces. These authors point out that "additional clinical studies are needed to verify the results of the dentifrice studied by Muhler and associates."

As part of a discussion on anti-caries technics, Hill[45] described a study on public school children to test the value of a stannous fluoride dentifrice. The reduction of DMF teeth in the control group was 16 percent at the end of the first year and 12 percent at the end of the second year. Reductions in DMF surfaces were 14 percent and 15 percent at the end of the first and second years, respectively.

Peffley and Muhler report on caries in children, using a commercial stannous fluoride dentifrice with supervised brushing three times a day. At the end of the ten months they found reductions of 93 percent in DMF teeth and 57 percent in DMF surfaces.

Muhler[47] tested the combined effect of the unsupervised use of a stannous fluoride

dentifrice and a single topical application of 8 percent stannous fluoride. The control group used a fluoride-free dentifrice and received one application of distilled water. One study group used a stannous fluoride dentifrice and received one application of distilled water. A second study group used the stannous fluoride dentifrice and received one application of an 8 percent stannous fluoride solution. After one year, the first study group showed 32 percent less DMF teeth and 23 percent less DMF surfaces, and the second group reported reductions of 58 percent in DMF teeth and 58 percent in DMF surfaces.

Keys, Overton, and McKean[48] conducted two-year clinical trials of two caries-inhibiting dentifrices on midshipmen at the U.S. Naval Academy. One study group used a sodium fluoride-lauroyl sarcosinate paste, a second group used a stannous fluoride paste, and the control groups used placebos. At the end of the first year there was no correlation between the amount of decay and the composition of the dentifrices. At the end of the second year the stannous fluoride users showed slightly fewer lesions, while the sodium fluoride-lauroyl sarcosinate users showed slightly more lesions than did the controls. No significant differences were found at the 5 percent level and most of the differences were not even significant at the 10 percent level of confidence. The authors conclude, "in young men of Naval Academy age, these particular decay-inhibiting ingredients failed to provide the benefits which have previously been reported by others."

Sulser, Fosket and Fosdick[49] studied the use of a sodium dehydroacetate-sodium oxalate dentifrice in the control of dental caries in young adults. During the first year, the reduction in the incidence of carious surfaces was 35-43 percent. The reduction in new DF teeth varied from 47 to 59 percent depending on the groups compared. These same comparisons the second year, resulted in reductions of 40-63 percent in surfaces and in 60-76 percent in new DF teeth. Brushing three times a day seemed to be slightly better than brushing twice a day.

Vogel and Hess[50] of the Dental Institute, University of Zurich, Switzerland, evaluated the caries-reducing effect of a dentifrice containing 13 percent carbamide and 3 percent dibasic ammonium phosphate. Sixth grade children were re-examined after 8 and 14 months use of the high urea denrifrice resulted in about 22 percent reduction in the first period and 34 percent reduction in the second period. The over-all reduction in caries activity was 28 percent.

Dibasic calcium phosphate is being studied as a dietary additive for a caries prevention. Investigators and grantees of the National Institute of Dental Research[51] have initiated clinical studies, in the United States and Brazil, incorporating this mineral in the flour used for baking bread used by the experimental groups. Arnold[52] points out that these phosphate studies are at essentially the same stage of progress that water-borne fluorides were in the beginning years of research.

Last year at the annual meeting of the American Public Health Association, Johansen[53] presented an interesting and provocative review of research related to nutrition and diet in dental health. His discussion and summary of studies in this field indicated that our present knowledge is quite inadequate and a great deal of research is waiting to be performed. The local dietary influence of carbohydrates appears to be well established.

Volker[54] in discussing the nutritional control of dental disease presents observations on studies concerned with the action of carbohydrates in producing dental caries. These factors include: consistency; retention; and the presence of micro-organisms.

Weiss and Trithart[55] studied the relationship of between-meal eating habits of preschool children and dental caries. Most items consumed between meals had a high sugar content or a high degree of adhesiveness. Caries experience was consistently related to the frequency of between-meal snacks. Children who reported eating no items of the above nature had a def of 3.3 teeth per child. Those who ate four or more such items between meals averaged 9.8 def teeth per child.

Down, Dunn and Richie[56] found significantly lower caries attack rates among Seventh Day Adventist students when compared to children in other schools. This, they point out, may be ascribed to the health and dietary principles advocated by the Seventh Day Adventist Church. The authors believe that additional studies in larger groups would be fruitful.

Bruszt[57] found similarities between the health of the primary and the permanent dentitions, in the same individual.

In a study of Negro children in Tennessee, Mobley[58] found caries rates higher in females than in males and higher in urban than in rural children. In 14-16 year old children, 40 percent of the missing teeth were first molars.

Studying sex differences in the prevalence of dental caries, Mansbridge[59] found that earlier eruption of permanent teeth in girls does not completely explain their higher caries rates. He believes that part of the difference in caries experience between the sexes is constitutional in origin.

Dental Fluorosis

Dental Fluorosis, although not affecting a large portion of the population, is often disfiguring and emotionally disturbing to those exposed to high fluoride water. Studies conducted by the Public Health Service on methods of removing excess fluorides from municipal water supplies have been in progress approximately eight years. Preliminary data (unpublished) from dental examinations conducted this past year indicate the success of these methods. Children who have used the defluoridated water during the period of tooth calcification are free from all but the mildest forms of fluorosis.

A new mechanical device is in development which should simplify the defluoridation process using either bone char or activated alumina. This method gives promise of lowering the cost of removing excess fluorides from communal water supplies.

Periodontal Disease and Oral Hygiene

The development by Russell[60] of a classification and scoring system for periodontal disease gave increased impetus to epidemiological studies in this field. Other workers[61-62] have devised systems of measuring periodontal disease to meet various requirements. As Greene[63] points out, no single system of classifying this disease will be appropriate for all types of research projects.

Reports by Belting,[64] Russell,[65] Parfitt,[66] and Benjamin and associates[67] describe some of the epidemiological characteristics of periodontal disease in urban and rural populations. These various observations describe some patterns of periodontal disease, as follows: the onset may occur early in life; advanced disease is not uncommon in teenage children; the prevalence and severity of the conditions increase with age; negroes show a higher prevalence and greater severity than whites; it is slightly more prevalent in males; gingivitis tends to reach a peak at age 13 in boys and age 11 in girls; and there is a lower incidence of gingivitis in the autumn months. Although rural periodontal scores were significantly higher than those reported for urban groups it was concluded that rural residence per se was not a factor influencing either the pre-

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valence or the severity of periodontal disease in children. Similar findings are reported by Mobley and co-workers[68] for negro teenage children in Tennessee.

On additional analysis of the data on rural children, Russell[69] found that the severity (but not necessarily the prevalence) of periodontal disease appears closely associated with an unknown social factor, indicated by the general educational level of the community or of the individual. He suggests "that some or all of the true etiologic factors in periodontal disease may be distinct from some or all of the factors which condition its severity once initiated."

An analysis of data on nearly 20,000 persons[70] compared the periodontal status of residents in fluoride and non-fluoride communities. In each case the fluoride group had a slightly better periodontal status. The findings clearly proved that the use of fluoride water is not harmful to the periodontal tissues of children or adults.

A study in Birmingham, Alabama[71] on periodontal disease and socioeconomics status found that higher periodontal scores are found among persons with lesser education, individuals with unmet dental needs, those in less favored occupational groups, and persons with obvious oral debris. Oral debris appeared to be the most deleterious factor of the several studied.

McCombie and Chua[72] found a similar relation between oral debris and periodontal scores in a study in Malaya. In addition, they found significant associations between dental caries experience and status of oral hygiene and between the average periodontal score and frequency of oral hygiene practices.

Belting and Gupta[73] demonstrated a higher incidence of periodontal disease among psychiatric patients.

Cohen, Winer, and Shklar[74] found periodontal disease more prevalent and more severe in Mongoloid children than in non-Mongoloid mentally subnormal patients.

A group in Oslo, Norway[75] found no difference in susceptibility to gingivitis related to sex or occupation but tobacco consumption seemed to be an etiologic factor and the efficiency of toothbrushing was related to gingival health.

Cadell[76] reports that the prevalence of periodontal disease was greatly reduced simply by removing calculus at regular intervals.

Other workers[77] found that a permissive program of toothbrushing was not effective in improving gingival tissues of young adults.

Parfitt[78] and co-workers did not assess oral hygiene but attempted to measure children's responses to health education by checking the gingival tissues. They found no change after 3 months of education.

Stanmeyer[79] attributed decreased gingival inflammation associated with increased frequency of toothbrushing to stinulation of the gingival tissues rather than improved oral hygiene.

Greene and Vermillion[80] recently published an Oral Hygiene Index. Six segments of the mouth(3 upper and 3 lower)are scored by determining the fraction of selected tooth surfaces covered by debris and calculus. The oral hygiene index is composed of the Debris Index and Calculus Index.

An inverse relationship between oral hygiene scores and toothbrushing frequency has been demonstrated. A positive correlation was shown between the Debris, Calculus, and Oral Hygiene Indexes and Russell's Periodontal Index. The Oral Hygiene Index was more closely associated with the periodontal scores than were either of its two components (debris and calculus). A comparison of study groups in Atlanta, Georgia and Bombay, India[81] produced similar associations.

The authors believe the Oral Hygiene Index is a sensitive, simple method for assessing group or individual oral hygiene quantively.

Dental surveys by Russell and associates[82] attempted to discover a relationship between periodontal status and the physical, biochemical, and dietary findings reported in field studies by the Interdepartmental Committee on Nutrition for National Defense. Dental examinations in Alaska, Ethiopia, Ecuador, Peru, and Vietnam produced striking differences in the prevalence or characteristics of periodontal disease (and dental caries) in the presence of varying nutritional findings in the groups.

However, the authors conclude that "no consistent patterns of association between nutrition and oral status have been developed in these data, so far as they have been analyzed at this time."

Parfitt[83] reports the gingival condition of Navajo Indian children equal to or better than that of Alabama children in spite of a diet lacking in milk and fresh fruits and vegetables.

Malocclusion

Progress has been made toward the development of indices for measuring malocclusion.

Van Kirk and Pennell[84] measured malalignment of teeth and report a direct association with other factors common to malocclusion. The scoring is based on the degree of rotation or displacement of teeth from the ideal arch line. The procedure is simple, requires only a small plastic gauge, and is readily applied in field programs. In tests it has correlated well with orthodontic diagnosis of need for treatment.

Draker[85] has proposed a measurement of handicapping labiolingual deviations (HLD Index) as an administrative tool for the public health dentist. The index scores seven labiolingual deviations to measure the degree of handicap without classifying malocclusion. The index can be applied to patients or plaster models, is simple to use, is readily reproducible and correlates well with clinical judgements by orthodontists.

Oral Cancer

Silverman[86] reviews the few studies undertaken in the field of intra-oral exfoliative cytology and discusses the potential of this technic in the early detection of oral cancer. Hesitancy and procrastination in securing tissue examination of other than clinically obvious lesions suggest the need for an adjunct to biopsy.

Sandler and Stahl[87] support this view and are conducting an extensive study involving several Veterans Administration Hospitals.

Umiker and co-workers[88] believe that oral cytology is an excellent adjunct to follow-up studies of treated oral cancer and may be an effective modality in the early detection of cancer and precancerous lesions of the mouth.

In cooperation with the Minnesota Department of Health, the Division of Dental Public Health and Resources currently is conducting a study designed to determine the value and acceptability of the intra-oral exfoliative cytologic technic as a preliminary screening method adjunctive to biopsy.

PROGRAM AREAS

Five regional studies of future dental manpower needs[89-93] show that, although requirements vary by region, all areas and the nation as a whole face a serious shortage of dental manpower in the next decade. Social and economic improvements in addition to population growth will increase demands for dental service.

However, studies in the behaviorial sciences which have nothing directly to do with the content of dental public health may be of great significance to planning programs in this area.

The several studies reported here are directly concerned with dental health.

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In analyzing voting behavior on a fluoridation referendum, Plaut[94] found that precincts supporting liberal positions on other issues also tended to support fluoridation. Ecologically such precincts were wealthier, had less crime, better housing, and more education. (This is one of several studies by the Social Science Program, Harvard School of Public Health. Results are available in mimeographed form).

Studies by Kegeles,[95] Weiss and Pelton,[96] and the American Dental Association[97] indicate that a very small proportion of the population sees a dentist frequently on a regular basis and that there are barriers other than financial that keep people from dental care. Attitudes towards dentists and dental care are specifically related to utilization of services.

Rosenstock, Hochbaum, and Kegeles[98] have summarized current knowledge on individual health behavior. An individual's behavior is determined by his own definitions of reality rather than by those of the professional expert. Six requirements are presented as necessary to cause a person to take a particular health action. Briefly these are: health matters are important to him; he believes he is susceptible and the occurrence would be serious; the threat is moderately intense; he believes that means exist for effective action; the positive aspects of action outweigh the negative aspects; and a cue occurs to trigger action.

A comprehensive final report[99] has been made on the Askov (Minnesota) dental demonstration. This ten-year study in community dental health included a combination of all approved dental health practices, except water fluoridation. Significant reductions, compared to baseline data, were demonstrated in tooth loss and in dental caries in primary and permanent teeth. These, however, were considerably less than similar benefits from community water fluoridation.

The Journal of the American Dental Association[100] commenting on the program states "the study, to put it in a nutshell, tends to show that if a community combines all the approved dental health practices but omits fluoridating the community water supply the benefits that accrue are only moderate. They are much less than the benefits received from fluoridated water and the cost is many times higher."

The Division of Dental Public Health and Resources of the Public Health Service currently is conducting studies[101-102] designed to produce information on the dental needs of chronically ill and aged, institutionalized and homebound patients and to develop methods of providing dental care to these groups. Preliminary data from these projects show a large backlog of unmet dental needs. Slightly less than one-third of the patients are untreatable for various reasons, about one-eighth need no treatment at the time of examination, and three-fifths need and can accept dental care. Of the treatable patients, 90 percent can be cared for in the dental office or clinic and about 10 percent must be treated at home. Cost of service and lack of transportation to the services are major barriers to care.

Surveys of similar groups in other areas[103-104] tend to support these general findings.

A recent survey of mentally retarded children[105] found 25-35 percent less dental caries than normal children but greater unmet needs and more severe forms of periodontal disease. Fifty percent were rated fully treatable in the dental office, 17 percent partially treatable, and 23 percent untreatable without general anesthesia.

Surveys of methods of financing dental services[96,106,110] provide data on the type of patient, the variety of services provided, and the pattern of utilization under prepayment and postpayment programs involving beneficiaries with varying economic situations.

A description of the development of a State dental service corporation[107] provides a pattern for the initiation and operation of a Statewide program for the provision of prepaid dental services.

The National Health Survey [111-113] shows that residents of the United States average about 1.5 dental visits per person per year. Approximately 41 percent of the dental visits involve fillings and 20 percent involve extractions. The rate of visits varies greatly with income, age, sex, education, and location. About 36 percent of the population visit their dentist at least once a year.

In 1957 there were approximately 21.6 million edentulous persons in the United States — 13 percent of the population. Over half of those aged 65 and over were edentulous.

BIBLIOGRAPHY

1. Hilleboe, H. E., et al. History of the Newburgh-Kingston caries-fluorine study. J. Am. Dent. A. 52:291-295, Mar. 1956
2. Arnold, F. A., Jr. Grand Rapids fluoridation study — results pertaining to the eleventh year of fluoridation. Am. J. Pub. Health 47:539-545, May 1957.
3. Brown, H. K., McLaren, H. R., and Poplove, Myron. The Brantford-Samia-Stratford fluoridation caries study — 1959 report. J. Can. Dent. A. 26:131-142, Mar. 1960.
4. Arnold, F. A., Jr. The present status of dental research in the study of fluorides: summary of report. Am. Med. A. Arch. Indust. Health 21:308-311, Apr. 1960.
5. Blaney, J. R. A report on thirteen years of water fluoridation in Evanston, Ill. J. Am. Dent. A. 61:76-79, July 1960.
6. Musselman, Paul. Report on dental findings in Newark, Delaware, children after five years of fluoridation. J. Am. Dent. A. 54:783-785, June 1957.
7. Chrietzberg, J. E., and Lewis, F. D., Jr. An evaluation of caries prevalence after five years of fluoridation. J. Am. Dent. A. 56:192-193, Feb. 1958.
8. Downes, Virginia, and Schultz, W. E. Report on results of a dental survey of 4660 Milwaukee school children conducted after six years of fluoridation. Milwaukee Health Dept., Dec. 1959 (mimeo).
9. Russell, A. L. Oral health study in children of suburban Washington, D. C. Pub. Health Rep. 71:626-632, June 1956.
10. McClure, F. J., and Zipkin, Isadore. Physiologic effects of fluoride as related to water fluoridation. The Dent. Clin. No. America, pp. 441-458, W. B. Saunders Co., July 1958.
11. Leone, N. C. The effects of the absorption of fluoride. I. outline and summary. Am. Med. A. Arch. Indust. Health 21:324-325, Apr. 1960.
12. Russell, A. L., and White, C. L. Dental caries in Maryland children after five years of fluoridation. Pub. Health Rep. 74:289-295, Apr. 1959.
13. Hill, I. N., Blayney, J. R., and Wolfe, Walter. The Evanston dental caries study. XIX. prevalence of malocclusion of children in a fluoridated area. J. Dent. Res. 38:782-794, July-Aug. 1959.
14. Maier, F. J., and Bellack, Ervin. Continuous recording of fluoride in water. Am. J. Pub. Health 47:1296-1304, Oct. 1957.
15. Bellack, Ervin. Simplified fluoride distillation method. J. Am. Water Works A. 50: 530-536, Apr. 1958.

XUM

16. Bellack, Ervin, and Schouboe, P. J. Rapid photometric determination of fluoride in water. Anal. Chem. 30:2032-2034, Dec. 1958.

17. Maier, F. J., and Bellack, Ervin. Fluorspar for fluoridation. J. Am. Water Works A. 40:34-40, Jan. 1957.

18. Maier, F. J. Advances in the use of fluorspar for fluoridation. J. Am. Water Works A. 52:97/105, Jan. 1960.

19. Water fluoridation practices in major cities of the United States (Summary Report). Prepared for New York State Department of Health by the New York University College of Engineering. Dec. 1958.

20. Spitz, Grace C. S., Taylor, F. B., and Harris, W. L. Experience in maintaining constant fluoride concentrations. Am. J. Pub. Health 48:1651-1659, Dec. 1958.

21. Taylor, F. B. Cumulative distribution method for evaluating a series of fluoride ion test results. J. Am. Water Works A. 52:466-470, Apr. 1960.

22. Lewis, F. D., Jr., and Leatherwood, E. C. Effect of natural fluorides on caries incidence in three Georgia cities. Pub. Health Rep. 74:127-131, Feb. 1959.

23. Maier, F. J. A system for fluoridating individual water supplies. Am. J. Pub. Health 48:717-723, June 1958.

24. Yacavone, J. A., and Lisanti, V. F. Effect of part-time exposure to natural waterborne fluorides on the incidence of dental caries. Arch. Oral Biol. 1:265-275, Jan. 1960.

25. Galagan, D. J., et al. Climate and fluid intake. Pub. Health Rep. 72:484-490, June 1957.

26. Galagan, D. J., and Vermillion, J. R. Determining optimum fluoride concentrations. Pub. Health Rep. 72:491-493, June 1957.

27. Expert Committee on Water Fluoridation, First Report. World Health Organization Technical Report Series No. 146, p. 19, Geneva 1958.

28. Rusoff, L. L., et al. Fluoridated milk for prevention of dental caries in children. Abstracts. Fifth International Congress on Nutrition, Washington, D. C., p. 31, Sept. 1-7, 1960.

29. Gish, C. W., Howell, C. L., and Muhler, J. C. A new approach to the topical application of fluorides for the reduction of dental caries in children. J. Dent. Res. 36: 784-786, Oct. 1957.

30. ——. A new approach to the topical application of fluorides in children, with results at the end of two years. J. Dent. Child. 24:194-196, 3rd Quarter 1957.

31. ——. Stannous fluoride vs. sodium fluoride – a progress report. J. Dent. Child. 25:177-179, 3rd Quarter 1958.

32. Gish, C. W., Muhler, J. C., and Howell, C. L. A new approach to the topical application of fluorides in children with results at end of four years. J. Dent. Child. 26: 300-303, 4th Quarter 1959.

33. McDonald, R. E., and Muhler, J. C. The superiority of topical application of stannous fluoride on primary teeth. J. Dent. Child. 24:84-86, 2nd Quarter 1957.

34. Muhler, J. C. Present status of topical fluoride therapy. J. Dent. Child. 26:173-185, 3rd Quarter 1959.

35. Jordan, W. A., Synder, J. R., and Wilson, Victor. Stannous fluoride clinical study in Olmsted County, Minnesota. Pub. Health Rep. 73:1010-1014, Nov. 1958.

XUM

36. _____. A study of a single application of eight per cent stannous fluoride. J. Dent. Child. 26:355-359, 4th Quarter 1959.

37. Nevitt, G.A., Witter, D.H., and Bowman, W.D. Topical applications of sodium fluoride and stannous fluoride. Pub. Health Rep. 73:847-850, Sept. 1958.

38. Law, F.E., Jeffrey, Margaret H., and Sheary, Helen C. Topical agents in dental caries control. I. applications of sodium and stannous fluoride solutions. (in press).

39. Howell, C. L., and Muhler, J. C. Effect of topically applied stannous chlorofluoride on the dental caries experience in children. II. results two years after initial treatment. J. Am. Dent. A. 55:493-495, Oct. 1957.

40. Muhler, J. C. The effectiveness of stannous fluoride in children residing in an optimal communal fluoride area. J. Dent. Child. 27:51-54, 1st Quarter 1960.

41. Muhler, J. C., et al. The effect of a stannous fluoride-containing dentifrice on dental caries in adults. J. Dent. Res. 35:49-53, Feb. 1956.

42. Muhler, J. C., and Radike, A. W. Effect of a dentifrice containing stannous fluoride on dental caries in adults. II. results at the end of two years of unsupervised use. J. Am. Dent. A. 55:196-198, 1957.

43. Jordan, W. A., and Peterson, J. K. Caries-inhibiting value of a dentifrice containing stannous fluoride: first years report of a supervised toothbrushing study. J. Am. Dent. A. 54:589-594, May 1957.

44. _____. Caries-inhibiting value of a dentifrice containing stannous fluoride: final report of a two year study. J. Am. Dent. A. 58:42-44, Jan. 1959.

45. Hill, T. J. Fluoride dentifrices. J. Am. Dent. A. 59:1121-1127, Dec. 1959.

46. Peffley, George, and Muhler, J. C. Effect of a commercial stannous fluoride dentifrice with controlled brushing on caries in children. J. Dent. Res. 38:670-671, July-Aug. 1959. (Abst.)

47. Muhler, J. C. The combined anticariogenic effect of a single stannous fluoride solution and the unsupervised use of a stannous fluoride dentifrice. J. Dent. Res. 38: 994-997, Sept.-Oct. 1959.

48. Keys, F. M., Overton, N. J., and McKean, T. W. Clinical trials of caries-inhibiting dentifrices. J. Dent. Res. 39:697, July-Aug. 1960 (Abst.).

49. Sulser, G. F., Fosket, R. R., and Fosdick, L. S. Use of a sodium dehydroacetate-sodium oxalate dentifrice in the control of dental caries. J. Am. Dent. A. 56:368-375, Mar. 1958.

50. Vogel, Paul, and Hess, Walter. Clinical evaluation of caries-reducing effect of a dentifrice, containing 13% carbamite and 3% dibasic ammonium phosphate. J. Dent. Child. 24:237-242, 4th Quarter 1957.

51. Highlights of progress in research on oral diseases. Public Health Service, National Institutes of Health, Public Health Service Pub. No. 760, Washington, U. S. Govt. Print. Off., 1959.

52. Arnold, F. A., Jr. Highlights of American dentistry in the field of research. Internat. Dent. J. 10:16-28, Mar. 1960.

53. Johansen, Erling. Nutrition, diet, and calcium metabolism in dental health. Am. J. Pub. Health 50:1089-1096, Aug. 1960.

54. Volker, J. F. Nutritional control of dental disease. J. Pros. Dent. 10:341-349, Mar.-Apr. 1960.

XUM

55. Weiss, R. L., and Trithart, A. H. Between-meal eating habits and dental caries experience in preschool children. Am. J. Pub. Health 50:1097-1104, Aug. 1960.

56. Downs, R. H., Dunn, Muriel M., and Richie, Eleanor L. Report of dental findings of Seventh Day Adventist students as compared to comparable students in other schools. Bul. Am. A. Pub. Health Dent. 18:19-29, Sept. 1958.

57. Bruszt, Paul. Comparative studies of the caries incidence in the deciduous and permanent dentition in the same individual. Schweiz. Mschr. Zahnhk. 68:705-713, Aug. 1958. (Dent. Abst. 5:105, Feb. 1960).

58. Mobley, Eugenia L. Dental needs of Negro teen-age children in rural and urban areas of Tennessee. The Dental Search-Light, Pan-Tenn. Dent. A. 10th Ed., Dec. 1959.

59. Mansbridge, J. N. Sex differences in the prevalence of dental caries. Brit. Dent. J. 106:303-308, May 5, 1959.

60. Russell, A. L. A system of classification and scoring for prevalence surveys of periodontal disease. J. Dent. Res. 35:350-359, June 1956.

61. Sandler, H. C., and Stahl, S. S. Measurement of periodontal disease prevalence. J. Am. Dent. A. 58:93-97, Mar. 1959.

62. Ramfjord, S. P. Indices for prevalence and incidence of periodontal disease. J. Periodont. 30:51-59, Jan. 1959.

63. Greene, J. C. Epidemiology and indexing of periodontal disease. J. Periodont. 30:133-139, Apr. 1959.

64. Belting, C. M. A review of the epidemiology of periodontal disease. J. Periodont. 28:37-45, Jan. 1957.

65. Russell, A. L. Some epidemiological characteristics of periodontal disease in a series of urban population. J. Periodont. 28:286-293, Oct. 1957.

66. Parfitt, G. J. A five year longitudinal study of the gingival condition of a group of children in England. J. Periodont. 28:26-32, Jan. 1957.

67. Benjamin, E. M., Russell, A. L., and Smiley, R. D. Periodontal disease in rural children of 25 Indiana counties. J. Periodont. 28:294-298, Oct. 1957.

68. Mobley, Eugenia L., and Pointer, Martha A. Dental caries and periodontal conditions among Negro children in Tennessee. J. Tenn. Dent. A. 40:21-28, Jan. 1960.

69. Russell, A. L. A social factor associated with the severity of periodontal disease. J. Dent. Res. 36:922-926, Dec. 1957.

70. _____. Fluoride domestic water and periodontal disease. Am. J. Pub. Health 47: 688-694, June 1957.

71. Russell, A. L., and Ayers, Polly. Periodontal disease and socioeconomics status in Birmingham, Ala. Am. J. Pub. Health 50:206-214, Feb. 1960.

72. McCombie, Frank, and Chua, S. C. Dental epidemiology in Malaya. II. a survey of Chinese, Malayan, and Indian young adult males in Singapore. J. Can. Dent. A. 23: 687-698, Dec. 1957.

73. Belting, C. M., and Gupta, O. P. Incidence of periodontal disease among persons with neuropsychiatric disorders. J. Dent. Res. 39:474, July-Aug. 1960 (Abst.).

74. Cohen, M. M., Winer, R. A., and Shklar, Gerald. Periodontal disease in a group of subnormal children. J. Dent. Res. 39:745, July-Aug. 1960 (Abst.).

XUM

75. Arno, Arnaulf, et al. Incidence of gingivitis as related to sex, occupation, tobacco consumption, toothbrushing and age. Oral Surg., Oral Med., Oral Path. 11:587-595, June 1958.

76. Cadell, P. B. Dental conditions amongst native Nauruans. (Naurn. Is., New Zealand) Austral. Dent. J. 4:389-394, Dec. 1959.

77. Massler, Maury, et al. Gingivitis in young adult males: the lack of effectiveness of a permissive program of toothbrushing. J. Periodont. 28:111-124, Apr. 1957.

78. Parfitt, G. J., James, P. M. C., and Davis, H. C. A controlled study of the effect of dental health education on the gingival structures of school children. Brit. Dent. J. 104:21-24, Jan. 7, 1958.

79. Stanmeyer, W. R. A measure of tissue response to frequency of toothbrushing. J. Periodont. 28:17-22, Jan. 1957.

80. Greene, J. C., and Vermillion, J. R. The oral hygiene index: a method for classifying oral hygiene status. J. Am. Dent. A. 61:172-179, Aug. 1960.

81. Greene, J. C. India periodontal disease study report No. 2. Public Health Service, National Institute of Dental Research, July-Aug. 1957. (mimeo).

82. Russell, A. L., et al. Dental surveys in relation to nutrition. Pub. Health Rep. 75:717-723, Aug. 1960.

83. Parfitt, G. J. A survey of the oral health of Navajo Indian children. Arch. Oral Biol. 1:193-205, Jan. 1960.

84. Van Kirk, L. E., Jr., and Pennell, E. H. Assessment of malocclusion in population groups. Am. J. Pub. Health 49:1157-1163, Sept. 1959.

85. Draker, H. L. Handicapping labio-lingual deviations: a proposed index for public health purposes. Am. J. Orthodont. 46:295-305, Apr. 1960.

86. Silverman, Sol, Jr. Early detection of oral cancer. Practical Dental Monographs, Chicago, Year Book Pub., July 1959.

87. Sandler, H. C., and Stahl, S. S. Exfoliative cytology as a diagnostic aid in the detection of oral neoplasms. J. Oral Surg. 15:414-418, Sept. 1958.

88. Umiker, W. O. Oral smears in the diagnosis of carcinoma and premalignant lesions. Oral Surg., Oral Med., Oral Path. 13:897-907, Aug. 1960.

89. A study of dental manpower requirements in the West. Prepared for Western Interstate Commission for Higher Education by Division of Dental Resources, Public Health Service, 1956.

90. Dental manpower needs in the South. Southern Regional Education Board, Atlanta, Nov. 1957.

91. Dental manpower needs in New England. New England Board of Higher Education, Winchester, Mass., Oct. 1958.

92. Pelton, W. J., and Bothwell, Ruth D. The dental profession in the Great Lakes region. J. Am. Col. Dent. 26:3-27, Mar. 1959.

93. Pelton, W. J., Bothwell, Ruth D., and Vavra, Helen M. The dental profession in the Midwest. Public Health Service Pub. 751, Washington, U. S. Govt. Print. Off., June 1960.

94. Plaut, T. F. Analysis of voting behavior on a fluoridation referendum. Pub. Opinion Quarterly 23:213-233, Summer 1959.

XUM

95. Kegeles, S.S. Why people seek dental care: a review of present knowledge (In press-Am. J. Pub. Health).

96. Dental care in a group purchase plan-a survey of attitudes and utilization at the St. Louis Labor Health Institute. Public Health Service Pub. No. 684, Washington, U. S. Govt. Print. Off., Aug. 1959.

97. A motivational study of dental care. Bureau of Economic Research and Statistics, American Dental Association. J. Am. Dent. A. 56:434-443 Mar.; 566-574 Apr.; 745-751 May; 911-917 June; 57:279 Aug. 1958.

98. Rosenstock, I. M., Hochbaum, G. M., and Kegeles, S. S. Determinants of health behavior. Paper requested by White House Conference on Children and Youth, Washington, D. C., Mar. 1960. (mimeo).

99. Jordan, W. A. The Askov dental demonstration, ADA ten-year study of a community dental health program, 1948-1958. North-West Dent. 38:444-465, Nov. 1959.

100. The ten-year Askov dental demonstration has come to a close: what did it prove? Edit. J. Am. Dent. A. 61:112-113, July 1960.

101. Law, F. E. Problems and programs of dental health care for chronic disease groups. J. Tenn. Dent. A. 39:201-207, July 1959.

102. _____. The role of the dental hygienist in the care of the chronically ill. J. Am. Dent. Hyg. A. 33:175-178, Oct. 1959.

103. Chrietzberg, J. E., Lewis, F. D., and Carroll, J. B. Survey of dental conditions in the nursing homes in Fluton County. J. Ga. Dent. A. 31:15-19, Jan. 1958.

104. Hass, R. L. Dental findings of nursing home residents in Northeast Illinois. Bul. Am. A. Pub. Health Dent. 19:1-2, Mar. 1959.

105. Snyder, J. R., Knopp, Judith J., and Jordan, W. A. Dental problems of non-institutionalized mentally retarded children. North-West Dent. 39:123-133, Mar. 1960.

106. Seifert, O. M., and Pelton, W. J. Budget payment plan of the Nevada State Dental Society, Public Health Service Pub. No. 651, Washington, U. S. Govt. Print. Off., Mar. 1959.

107. Casto, G. N., and Pelton, W. J. A dental society reports on budget payment. Public Health Service Pub. No. 717, Washington, Govt. Print. Off., 1960.

108. McIntyre, T. J., and Pelton, W. J. The dental service corporation in a public assistance program – a report from Washington State. Public Health Service Pub. No. 680, Washington, U. S. Govt. Print. Off., June 1959.

109. Smith, Q. M., and Pennell, E. H. Pricing denticare. J. Am. Dent. A. 60:471-478, Apr. 1960.

110. Bowler, F.T., and Pelton, W.J. The dental service corporation: a new approach to dental care. Public Health Service Pub. No. 570, Washington, Govt. Print. Off., Jan. 1958.

111. Preliminary report on volume of dental care. U. S. National Health Survey. Public Health Service Pub. No. 584-B2, Washington, Govt. Print. Off., Mar. 1958.

112. Dental care volume of visits. U. S. National Health Survey. Public Health Service Pub. No. 584-B15, Washington, Govt. Print. Off., Apr. 1960.

113. Older persons selected health characteristics. U. S. National Health Survey. Public Health Service Pub. No. 584-C4, Washington, Govt. Print. Off., Sept. 1960.

Dr. Frank E. Law is Chief of the Disease Control Branch, Division of Dental Public Health and Resources, Public Health Service, U.S. Department of Health, Education and Welfare Washington, D.C. This paper was presented at the Annual Meeting, American Public Health Association, San Francisco, November 1, 1960.

ASSOCIATION AFFAIRS

MINUTES OF EXECUTIVE COUNCIL MEETING
Morrison Hotel, Chicago, Illinois
February 4, 1961

Members Present:

Kroschel, Gerrie, Draker, Howell and Trithart.

Visitors:

Doctors Ostrow, Grace, Young, and Wertheimer,
Mr. Van Sill and Mr. C. Dexter Kimsey.

Meeting was called to order at 4:00 P.M. by Dr. Kroschel, President.

1. Mr. Van Sill demonstrated a visual education kit on fluoridation of public water supplies. The kit is designed to be used with individuals and small groups, and includes: (1) pamphlet on organizing a fluoridation program; (2) series of 60 flip-over charts; (3) booklet "What Is The Real Story About Fluoridation"; (4) where to get speakers on fluoridation; and (5) a list of educational materials, and where to get them.

   Mr. Van Sill requested that the Association sponsor the production of these kits. The Executive Council endorsed the kits, but could not visualize a method of publication or distribution of the kits by the Association. The Executive Committee suggested that Mr. Van Sill continue with the development of the kits, and that the Association membership assist in the promotion and use of them. (EDITOR'S NOTE: In the meantime, President Kroschel has obtained the unanimous consent of the Executive Council by mail vote, and instructed the editor and publisher to proceed with the production of this material.)

2. Wesley Young, representing the Dental Section, A.P.H.A., reported that the publication "Public Health Dentistry" could not serve as the joint publication of the Dental Section, A.P.H.A. and the A.A.P.H.D. since membership in the A.A.P.H.D. is restricted to dentists, while membership in the Dental Section A.P.H.A. includes other professions.

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Recess for Dinner at 6:00 P.M. Reconvened at 8:00 P.M.

3. Dr. Gerrie reported for the Committee on Group Management. This Committee had spent much time and thought on this assignment (See Committee report), and concluded it would not be in the best interest of the Association to enter into a contract for Group Management.

   The Executive Committee concurred with this report, and agreed that a contractual agreement should not be entered into at this time.

   The Executive Committee further agreed that incorporation of the Association should be deferred until a later date.

4. The Executive Committee noted that the one-year editorship term of Dr. Harry Draker had expired. The Committee expressed its appreciation to Dr. Draker for a commendable job, and asked that he accept an indefinite appointment, with the term of office at the discretion of the Executive Committee. Dr. Draker accepted the appointment.

Meeting adjourned at 9:15 P.M.

MINUTES OF MID-WINTER MEETING OF THE
AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS
Morrison Hotel, Chicago, Illinois
February 5, 1961

Active and Associate Members in Attendance:

Arra, Averill, Ayers, Braye, Cons, Diefenbach, Downs, Draker, Forsyth, Franke, Frankel, Frey, Friend, Gerrie, Gish, Grace, Hass, Heck, Hoag, Howell, Kimmel, Kitchin, Kral, Kroschel, Lewis, Jr., James Lewis, Lotzkar, Louden, Mergele, O'Brien, Ostrow, Phelan, Putnam, Quaw, Ryder, Sellingsloh, Sinchak, Joseph Smith, Quinton Smith, Snyder, Stein, Stockton, Stone, Trithart, Wertheimer, and Zajdzinski.

Visitors:

Hilarie P. Anhalt, Dwight Bailey, Robert Booth, R. L. Christiansen, Leo Commiskey, R. E. Dudenbostel, N. J. Hannon, Jr. J. R. Hull, S. N. Kauffman, Betty Krippene, Rudolph Lodeesen, Lester Moore, Mauricio Moscovici, W. J. Page Jr., Albert Petrizzi, D. W. Podshadley, C. A. Sterling, A. P. White, C. P. White, and M. L. White.

1. Meeting was called to order by Dr. Kroschel at 9:30 A.M.

President Kroschel welcomed the attendants of Institutional and Public Service Dentists, and invited them to membership in the Association.

President Kroschel also reminded the membership of the dates of the State and Territorial Dental Directors' meeting in Chicago just preceding it.

2. Reading and adoption of the Minutes:

It was moved and seconded that the reading of the Minutes of the Los Angeles meeting be dispensed with, and the Minutes be accepted as published. Carried.

3. Reports of Officers:

Health Education - No report - John K. Peterson, Chairman.
Public Health Legislation - oral report - A. Harry Ostrow, Chairman.

Program - Written report - John M. Frankel, Chairman.
Philadelphia Meeting (no report) Charles J. Gillooly, Chairman.
Records and Reports (no report) Charles Henshaw resigned as Chairman. James P. Lewis was appointed to Chairmanship.

5. Reports of Reference Committees:

Resolutions (written) Harry W. Bruce, Jr. Chairman
Report of Officers (no report) Polly Ayers, Chairman

6. Reports of Special Committees:

Awards (no report) George A. Nevitt, Chairman.
Constitution and By-Laws (no report) Donald A. Galagan, Chairman.
Bulletin (oral report) Harry L. Draker, Editor
Chronic Disease (oral report) William J. Putnam, Chairman
Dental Public Health Curriculum (no report) R. L. Weiss, Chairman.
Federal Grants-In-Aid (oral report) W. O. Young, Chairman.
Dental Public Health Specialty (no report) P. E. Blackerby, Jr. Chairman.
Workshop On Local Dental Public Health Programs (no report) Kenneth W. Easlick, Chairman. Oral report by Norman Gerrie and Hugh M. Averill.
A.D.A. Relations (no report) Charles W. Gish, Chairman.
Necrology and History (written report) Richard C. Leonard, Chairman.
Group Management (written and oral report) Norman F. Gerrie, Chairman. This report was discussed at some length by the membership and members of the Executive Council.
Committee on Committees (oral report) Written report to be submitted later. V. L. Diefenbach, Chairman. This Committee report elicited considerable discussion, since it recommended revamping Association Committee structure, with specific areas of responsibility assigned to each committee.

7. New Business:

Moved, seconded and carried that the Report of the Committee on Committees be accepted, and that the Committee be thanked for a job well done, and that the new President re-appoint this Committee, and that it continue to function along the lines described by Chairman Diefenbach.
Dr. Gerrie spoke on behalf of the Association in thanking Dr. Draker for a job well done as Editor of "Public Health Dentistry".
An expression of thanks was also given to Dr. Frankel and other members of the Local Arrangements and Program Committi for the success of the meeting.

Adjourned 11:50 A.M.

American Association of Public Health Dentists
Report of Committee on Incorporation,
and Contract with Group Management, Inc.
February 5, 1961

Mr. President:

At the annual meeting of the Association in Los Angeles on October 16, 1960, this committee was instructed to a) proceed with the incorporation of the Association, and b) develop a contract with Group Management, Inc., under the terms of which that concern would assume the conduct of business affairs of the Association, including publication of the Bulletin.

In pursuing these charges the committee has had two meetings with Mrs. Ruth Barnhart, the President of Group Management, Inc. The first meeting, held in Albany, New York, on November 25, 1960, was attended by Dr. David Ast, Dr. Harry Draker, Dr. Arthur Buschel and the Committee Chairman. A copy of the minutes of this meeting is attached to this report.

Briefly, at this meeting decision was reached to incorporate the Association under the laws of the State of Illinois, employing the gratuitous legal services of Group Management, Inc., with a resultant considerable financial saving to the Association. Mr. Philip Glaberman of Albany was retained as legal representative of the Association to review the incorporation procedure, and to preserve the interests of the Association in the subsequent development of a contract with Group Management, Inc.

At this meeting, also, the terms of a proposed contract were reviewed. Although the general provisions of the contract were acceptable, the financial reimbursement provision was not considered satisfactory by the committee and no agreement was reached. It was decided, therefore, to meet again with Mrs. Barnhart and consider alternative financial arrangements.

The second meeting of the committee was held in New York City on December 8, 1960, and was attended by Dr. William P. Kroschel, Dr. Draker and Dr. Buschel. At this meeting the wording of the objectives of the Association for purposes of incorporation was reviewed and adopted. A copy of the revision is attached to this report.

A revised proposed memorandum of agreement (contract) between the Association and Group Management, Inc. was considered. A copy, including a list of services to be provided by Group Management is attached. The contract financial arrangements had been revised to provide that the Association would pay to Group Management 85 percent of all income received by the Association as full and complete reimbursement for services performed.

After comparing the relative merits of the two proposed methods of payment, the committee was inclined to favor the original method which provided that Group Management would receive 75% of all income exclusive of advertising revenue. Advertising income would be divided on the following basis: 35 percent to Group Management as the usual fee for soliciting advertising, and the remaining 65 percent to the Association. If production costs of the Bulletin rose as the result of format changes to attract more advertising, all or any part of this 65 percent could be drawn upon by Group Management to defray these increased costs. Attached to this report are copies of tables showing estimated income distribution at the present time and under the proposed alternative contract arrangements.

Since the final acceptance of the terms of the contract with Group Management involved a major policy decision with respect to the method of paying Group Management for services rendered, the committee preferred to have the Executive Council of the Association review the matter.

Analysis of estimates of projected Association income indicates the need to increase simultaneously membership and subscriptions to the Bulletin if the financial basis of the organization is to attain a reasonable level of security while meeting the needs of its members.

As the result of further discussion and consideration of estimated Association income it became evident that committee sentiment favored a conservative approach in the development of the Bulletin, and that the Association should expand its membership to increase income before committing itself to a substantial increase in Bulletin production costs.

Therefore, in view of the fact that these estimates show that the Association membership should be in the neighborhood of 500 before income would be at a level to permit a contract with Group Management which was established on a sound fiscal basis, the Committee has decided to not consider a contract at this time.

Furthermore, since incorporation was an action essential to the formulation of a contract for management services, steps toward incorporation will be held in abeyance until the need again arises.

Your Committee recognizes that the period of one year constituting the original appointment in office of the Editor of the Bulletin has expired. It is recommended consequently, that Dr. Draker be continued in office at the discretion of the Executive Council.

Through its contacts with the Editor since his appointment, your Committee has been impressed with his conscientious devotion to the duties and responsibilities of his office, and with the success attained in exploring ways of developing the Bulletin as an instrument to implement the objectives of the Association. Your Committee feels, therefore, that Dr. Draker merits the appreciation and sincere thanks of the Association for his efforts in the combined office of Editor-Publisher.

Respectfully submitted,
NORMAN F. GERRIE,
Chairman

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RESOLUTIONS COMMITTEE REPORT
February 2, 1961.

All members of the Resolutions Committee as appointed have been contacted and expressed a willingness to serve. It was generally agreed at the Los Angeles meeting that the objectives of the Association should be as follows:

1. To promote knowledge, understanding and appreciation of dental public health within organized dentistry.
2. To provide a medium of liaison between the public health dentists and organized dentistry.
3. To provide a medium for the exchange of knowledge, ideas and information, and the dissemination of same within the dental public health profession and organized dentistry.
4. To promote the modernization and improvement of the practice of dental public health.
5. To give support to local dental public health programs and personnel, and to foster new local programs, where feasible.
6. To promote the continued improvement in dental services provided in all publicly supported dental care programs.

Since the objectives have been accepted in principle, it was the feeling of the Resolutions Committee that specific resolutions should be formulated to implement the objectives.

All members of the Committee have been contacted concerning their suggestions of appropriate resolutions. It has been tentatively decided that resolutions will be formulated in the following areas:

1. Co-operative working relationship between dental public health and public assistance programs.
2. Co-operative working relationship between dental public health programs and industrial dental programs.
3. Relationship of the AAPHD with the American Dental Association.
4. Professional direction of dental activities in medical care programs of departments of public assistance.
5. The use of topical application of stannous fluoride in public dental programs.
6. An association position statement relative to the promotion of fluoride containing dentifrices.

It is the plan of the Committee to develop specific resolutions which will be presented at the annual meeting.

Respectfully submitted,
Harry W. Bruce, Jr.
Chairman

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REPORT OF TREASURER

Balance at beginning of 1960-61 term	$485.72
Money deposited through January 31, 1961	696.00
Total Receipts	$1181.72
Disbursements to January 31, 1961	492.41 *
Cash on Hand	$ 689.31

*Does not show cash expenditures of approximately $20.00 for postage, etc.

REPORT OF SECRETARY
1960-61

Active Members	136
Associate Members	22
Honorary Members	1
Total	159

The above summary includes 2 new active members As of January 31, 1961.

AAPHD MEMBERSHIP COMMITTEE REPORT

To date the Membership Committee has passed upon the qualifications of two applicants for membership. They are:

Name	Address	Title
Lawrence K. MacGregor	Box 1005 Fond du Lac, Wisc.	Private Practitioner
Joseph F. Stolla	5025 Turney Road, Cleveland 25, Ohio	Chief of Dental Department Cleveland State Hospital

Each member has now received a list of the current membership, and the portion of constitution and bylaws of the association which deals with membership eligibility is being sent to all members of the committee. It is hoped that the members of the committee can develop an active membership campaign in the near future.

Respectfully submitted,
Carl L. Sebelius, Chairman.

REPORT OF NECROLOGY AND HISTORY COMMITTEE

". . . Reluctantly I accept. My reluctance is premised on: (1) my personal feeling that "necrology" and "history" are not a logical combination, (2) my fear that my effort as a historian will not be as objective as would be the work of someone less involved in certain historic occasions, and (3) I may not be able to attend the semi-annual meeting in Chicago.

I am sending a copy of this letter to each of the listed fellow committee members and to Harry Draker. To the members asking their co-operation and to Harry requesting a Bulletin plea to all A.A.P.H.D. members to keep our committee apprised of all deaths and, so far as possible, data regarding a deceased member.

Richard C. Leonard,
Chairman

Editorial

A rocket blasts off – and minutes later a photograph is radioed back. It shows the sharp outlines of a continent, half an ocean and the earth's curvature. The "bird's eye view" these days comes from a satellite – and that is why our horizons have grown bigger.

LOOKING AROUND US

Our international issue collects, for the first time in the history of the American Association of Public Health Dentists, facts about public health dentistry in other lands. There is no system to the selection of published papers; wherever contacts could be made and wherever contributors volunteered, they were invited to speak up for their Country. Noteworthy exceptions are the European countries; their well developed and varying systems of providing for the public's dental health are rather well known, although the lessons available there have not necessarily been applied elsewhere. As far as American contributions are concerned, their distinct and in many ways unique features become clear from a research review by Dr. Frank Law.

Our authors discuss public health dental programs in all stages of development. It even includes one which we are particularly happy to print because *Sierra Leone* on the West African coast is just about to begin life as an independent nation as this issue appears. Here then is public health planning in its incubation stage.

No public health dentist who carefully reads the papers in this issue can fail to be impressed with the thought that we have much to learn – and much to teach. If the arousing prospect of working with new nations outlined in President Kennedy's Peace Corps Program has meaning to public health dentistry, then this issue, we feel, documents both the need and the potential.

HLR

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W.H.O. CUTS 1961 DENTAL BUDGET BY ONE–THIRD

Actions requested in the following countries have been denied for 1961: Brazil, Ceylon, Fiji, Ghana, Malaya, Pakistan, Uraquay, Africa and the Americas.

The budget was reduced from $180,150 to $120,936. W.H.O., dental activities are to be carried out in Burma, India, Indonesia, Ethiopia, Sudan, Lebanon, Thailand and Brazil.

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Turkey is planning to create a national health service modeled on the British system.

Announcing the plan, the National Unity Committee said the cost of establishing the service by 1977 was expected to be the equivalent of $450,000,000.

A committee spokesman said the system would be tried in three areas and would then be extended over a fifteen-year period to the entire country.

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MC NEIL WRITING BOOK ON FLUORIDATION OPPONENTS

Donald R. McNeil, author of the "Fight for Fluoridation," is assembling material for a paperback book on the opponents of fluoridation. It is believed that the book will prove of great help to every community concerned with the measure.

Members of AAPHD who have material on the opponents are asked to forward copies to Mr. Donald R. McNeil, 44 South Miller Street, Mesa, Arizona.

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FOOD FOR THOUGHT

Harlan Cleveland, dean of Syracuse University's Maxwell Graduate School, said: "We know in our hearts that we are in the world for keeps, yet we are still tackling twenty-year problems with five-year plans staffed with two-year personnel with one-year appropriations."

Editors Note

Due to space limitations, several of our usual features had to be omitted from this issue

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AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

MEMBERSHIP APPLICATION

Enclosed is my check for $8.00. Please enroll me as a member of the American Association of Public Health Dentists for the year 1961.

I understand that my membership includes a subscription to PUBLIC HEALTH DENTISTRY, the official Bulletin of the American Association of Public Health Dentists.

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Signature

Please complete and return with your remittance to: Dr. Albert H. Trithart, Secretary-Treasurer, Montana State Board of Health, Sam W. Mitchell Building, Helena, Montana.